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**ENVIRONMENTAL PROTECTION AGENCY**

**40 CFR Part 98**

**[EPA-HQ-OAR-2011-0147; FRL-9493-9]**

**RIN 2060-AQ85**

**Mandatory Reporting of Greenhouse Gases**

**AGENCY:** Environmental Protection Agency (EPA).

**ACTION:** Final rule.

**SUMMARY:** The EPA is amending specific provisions in the Mandatory Reporting of Greenhouse Gases Rule to correct certain technical and editorial errors that have been identified since promulgation and to clarify certain provisions that have been the subject of questions from reporters. These final changes include additional information to clarify compliance obligations, correct data reporting elements so they more closely conform to the information used to perform calculations, and make other corrections and amendments. In addition, these final amendments allow a limited, one-time six month extension of the 2012 reporting deadline for facilities and suppliers that contain one or more source categories for which data collection began in 2011.

**EFFECTIVE DATE:** The final rule amendments are effective on [INSERT THE DATE 30 DAYS AFTER PUBLICATION OF THIS FINAL RULE IN THE FEDERAL REGISTER].

**ADDRESSES:** The EPA has established a docket for this action under Docket ID No. EPA-HQ-OAR-2011-0147. All documents in the docket are listed in the <http://www.regulations.gov> index. Although listed in the index, some information is not publicly available, e.g., confidential business information (CBI) or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the Internet and will be publicly available only in hard copy form. Publicly available docket materials are available either electronically through <http://www.regulations.gov> or in hard copy at the EPA's Docket Center, Public Reading Room, EPA West Building, Room 3334, 1301 Constitution Avenue, NW, Washington, DC 20004. This Docket Facility is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566-1744, and the telephone number for the Air Docket is (202) 566-1742.

**FOR FURTHER INFORMATION CONTACT:** Carole Cook, Climate Change Division, Office of Atmospheric Programs (MC-6207J), Environmental Protection Agency, 1200 Pennsylvania Ave., NW, Washington, DC 20460; telephone number: (202) 343-9263; fax number: (202) 343-2342; email address: [GHGReportingRule@epa.gov](mailto:GHGReportingRule@epa.gov). For technical information and implementation materials, please go to the Greenhouse Gas Reporting Program website

<http://www.epa.gov/climatechange/emissions/ghgrulemaking.html>.

To submit a question, select Rule Help Center, followed by Contact Us.

**SUPPLEMENTARY INFORMATION:**

Regulated Entities. The Administrator determined that this action is subject to the provisions of Clean Air Act (CAA) section 307(d). See CAA section 307(d)(1)(V) (the provisions of section 307(d) apply to "such other actions as the Administrator may determine"). These are final amendments to existing regulations. These amended regulations affect owners or operators of certain industrial gas suppliers, direct emitters of GHGs, and facilities that geologically sequester or otherwise inject carbon dioxide (CO<sub>2</sub>) underground. Regulated categories and examples of affected entities include those listed in Table 1 of this preamble:

**Table 1. Examples of Affected Entities by Category**

Category	NAICS	Examples of affected facilities
Magnesium Production	331419	Primary refiners of nonferrous metals by electrolytic methods.
	331492	Secondary magnesium processing plants.
Petroleum and Natural Gas Systems	486210	Pipeline transportation of natural gas.
	221210	Natural gas distribution facilities.
	211	Extractors of crude petroleum and natural gas.
	211112	Natural gas liquid extraction facilities.
Underground Coal Mines	212113	Underground anthracite coal mining operations.
	212112	Underground bituminous coal mining operations.
Electronics Manufacturing	334111	Microcomputers manufacturing facilities.

Category	NAICS	Examples of affected facilities
	334413	Semiconductor, photovoltaic (solid-state) device manufacturing facilities.
	334419	LCD unit screens manufacturing facilities.
	334419	MEMS manufacturing facilities.
Electrical Transmission and Distribution Equipment Use	221121	Electric bulk power transmission and control facilities.
Electric Equipment Manufacture or Refurbishment	33531	Power transmission and distribution switchgear and specialty transformers manufacturing facilities.
Fluorinated GHG Production	325120	Industrial gases manufacturing facilities.
Importers and Exporters of Pre-charged Equipment and Closed-Cell Foams.	423730	Air-conditioning equipment (except room units) merchant wholesalers.
	333415	Air conditioning equipment (except motor vehicle) manufacturing.
	423620	Air conditioners, room, merchant wholesalers.
	443111	Household appliance stores.
	326150	Polyurethane foam products manufacturing.
	335313	Circuit breakers, power, manufacturing.
	423610	Circuit breakers merchant wholesalers.
Industrial Wastewater Treatment	322110	Pulp mills.
	322121	Paper mills.
	322122	Newsprint mills
	322130	Paperboard mills.
	311611	Meat processing facilities.
	311411	Frozen fruit, juice, and vegetable manufacturing facilities.
	311421	Fruit and vegetable canning facilities.
	325193	Ethanol manufacturing facilities.
	324110	Petroleum refineries.
Suppliers of Industrial GHGs	325120	Industrial gas production facilities.
CO <sub>2</sub> Enhanced Oil and Gas Recovery Projects	211	Oil and gas extraction projects using CO <sub>2</sub> enhanced oil and gas recovery.
Acid Gas Injection Projects	211111	Projects that inject acid gas containing CO <sub>2</sub> underground.
	211112	
Geologic Sequestration of Carbon Dioxide	N/A	CO <sub>2</sub> geologic sequestration projects
Industrial Waste Landfills	562212	Solid waste landfills.
	322110	Pulp mills.
	322121	Paper mills.
	322122	Newsprint mills.
	322130	Paperboard mills.
	311611	Meat processing facilities.

Category	NAICS	Examples of affected facilities
	311411	Frozen fruit, juice, and vegetable manufacturing facilities.
	311421	Fruit and vegetable canning facilities.
	221320	Sewage treatment facilities.

Table 1 of this preamble is not intended to be exhaustive, but rather lists the types of facilities or suppliers that the EPA is now aware could potentially be affected by the reporting requirements. Other types of facilities and suppliers than those listed in the table could also be subject to reporting requirements. To determine whether you are affected by this action, you should carefully examine the applicability criteria found in 40 CFR part 98, subpart A or the relevant criteria in the sections related to suppliers and direct emitters of GHGs. If you have questions regarding the applicability of this action to a particular facility or supplier, consult the person listed in the preceding **FOR FURTHER GENERAL INFORMATION CONTACT** section.

Judicial Review. Under section 307(b)(1) of the CAA, judicial review of this final rule is available only by filing a petition for review in the U.S. Court of Appeals for the District of Columbia Circuit (the Court) by [INSERT THE DATE 60 DAYS AFTER THE DATE OF PUBLICATION OF THE FINAL RULE IN THE FEDERAL REGISTER]. Under CAA section 307(d)(7)(B), only an objection to this final rule that was raised with reasonable specificity during the period for public comment can be raised

during judicial review. Section 307(d)(7)(B) of the CAA also provides a mechanism for the EPA to convene a proceeding for reconsideration, "[i]f the person raising an objection can demonstrate to EPA that it was impracticable to raise such objection within [the period for public comment] or if the grounds for such objection arose after the period for public comment (but within the time specified for judicial review) and if such objection is of central relevance to the outcome of the rule." Any person seeking to make such a demonstration to us should submit a Petition for Reconsideration to the Office of the Administrator, Environmental Protection Agency, Room 3000, Ariel Rios Building, 1200 Pennsylvania Ave., NW., Washington, DC 20460, with a copy to the person listed in the preceding **FOR FURTHER GENERAL INFORMATION CONTACT** section, and the Associate General Counsel for the Air and Radiation Law Office, Office of General Counsel (Mail Code 2344A), Environmental Protection Agency, 1200 Pennsylvania Ave., NW., Washington, DC 20004. Note, under CAA section 307(b)(2), the requirements established by this final rule may not be challenged separately in any civil or criminal proceedings brought by the EPA to enforce these requirements.

Acronyms and Abbreviations. The following acronyms and abbreviations are used in this document.

acf            actual cubic feet

AGR	acid gas removal
ASTM	American Society for Testing and Materials
BAMM	best available monitoring methods
CAA	Clean Air Act
CBI	confidential business information
CEMS	continuous emissions monitoring system
CFC	chlorofluorocarbon
CFR	Code of Federal Regulations
CH <sub>4</sub>	methane
CO <sub>2</sub>	carbon dioxide
DOC	degradable organic carbon
EF	emission factor
e-GGRT	electronic-GHG Reporting Tool
EPA	U.S. Environmental Protection Agency
FR	Federal Register
GHG	greenhouse gas
GHGRP	Greenhouse Gas Reporting Program
HCFC	hydrochlorofluorocarbon
kg	kilograms
kg/ft <sup>3</sup>	kilograms per cubic foot
mcf	methane correction factor
MMscf	million standard cubic feet
MRV	monitoring, reporting and verification
MSHA	Mine Safety and Health Administration
MtCO <sub>2</sub> e	metric tons carbon dioxide equivalent
N <sub>2</sub> O	nitrous oxide
NAICS	North American Industry Classification System
NOAA	National Oceanic and Atmospheric Administration
NTTAA	National Technology Transfer and Advancement Act
OMB	Office of Management and Budget
PFCs	perfluorocarbons
QA/QC	quality assurance/quality control
psia	pounds per square inch absolute
RFA	Regulatory Flexibility Act

SBREFA	Small Business Regulatory Enforcement Fairness Act
SF <sub>6</sub>	sulfur hexafluoride
U.S.	United States
UMRA	Unfunded Mandates Reform Act of 1995

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### **I. Background**

- A. How is this preamble organized?



The first section of this preamble contains the basic background information about the origin of these rule amendments. This section also discusses the EPA's use of our legal authority under the Clean Air Act to collect data under the Mandatory Reporting of Greenhouse Gases (GHG reporting) rule.

The second section of this preamble describes in detail the rule changes that are being promulgated to, among other things, correct technical errors, provide clarification, and address implementation issues identified by the EPA and others. This section also presents a summary and the EPA's response to the major public comments submitted on the proposed rule amendments, and significant changes, if any, made since proposal in response to those comments. Responses to additional comments received can be found in the document, "Response to Comments: 2011 Technical Corrections, Clarifying and Other Amendments to Certain Provisions of the Mandatory Reporting of Greenhouse Gases Rule" (see EPA-HQ-OAR-2011-0147).

Finally, the last (third) section of the preamble discusses the various statutory and executive order requirements applicable to this rulemaking.

#### B. Background on this Action.

The 2009 final GHG reporting rule (2009 final rule) was signed by EPA Administrator Lisa Jackson on September 22, 2009

and published in the Federal Register on October 30, 2009 (74 FR 56260, October 30, 2009). The 2009 final rule, which became effective on December 29, 2009, includes reporting of GHGs from various facilities and suppliers, consistent with the 2008 Consolidated Appropriations Act<sup>1</sup>. Subsequent notices were published in 2010 promulgating the requirements for subparts FF, II, and TT (75 FR 39736, July 12, 2010), subpart DD (75 FR 74774, December 1, 2010) and subpart RR (75 FR 75060, December 1, 2010). Subpart OO, which was promulgated as part of the 2009 final rule was also revised in 2010 (75 FR 79092, December 17, 2010). The source categories in 40 CFR part 98 (Part 98) cover approximately 85-90 percent of U.S. GHG emissions through reporting by direct emitters, as well as suppliers of certain products that would result in GHG emissions when released, used, or oxidized, and those that geologically sequester or otherwise inject carbon dioxide (CO<sub>2</sub>) underground.

The EPA published a notice proposing these amendments on August 4, 2011 (76 FR 47392). The public comment period for the proposed rule amendments ended on September 19, 2011. The EPA did not receive any requests to hold a public hearing.

### C. Legal Authority.

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<sup>1</sup> Consolidated Appropriations Act, 2008, Public Law 110-161, 121 Stat. 1844, 2128.

The EPA is finalizing these rule amendments under its existing CAA authority, specifically authorities provided in CAA section 114.

As stated in the preamble to the 2009 final rule (74 FR 56260) and the Response to Comments on the Proposed Rule, Volume 9, Legal Issues, CAA section 114 provides the EPA broad authority to require the information to be gathered by this rule because such data would inform and are relevant to the EPA's carrying out a wide variety of CAA provisions. As discussed in the preamble to the initial proposed rule (74 FR 16448, April 10, 2009), CAA section 114(a)(1) authorizes the Administrator to require emissions sources, persons subject to the CAA, manufacturers of control or process equipment, or persons whom the Administrator believes may have necessary information to monitor and report emissions and provide such other information the Administrator requests for the purposes of carrying out any provision of the CAA. For further information about the EPA's legal authority, see the preambles to the 2009 proposed and final rules and the EPA's Response to Comments Documents.<sup>2</sup>

D. How will these amendments apply to 2012 reports?

We have determined that it is feasible for the sources to implement these technical amendments for the 2011 reporting year

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<sup>2</sup> 74 FR 16448 (April 10, 2009) and 74 FR 56260 (October 30, 2009). Response to Comments Documents can be found at <http://www.epa.gov/climatechange/emissions/responses.html>

because the revisions primarily provide additional clarification regarding the existing regulatory requirements, do not change the type of information that must be collected, and do not materially affect how GHG emissions or quantities are calculated. Our rationale for this determination is explained in the preamble to the proposed rule amendments.<sup>3</sup> In response to general comments submitted on the proposed rulemaking, we have again reviewed the final amendments and determined that they can be implemented, as finalized, for the 2011 reporting year. These amendments do not require any additional monitoring or data collection above what was already included in 40 CFR part 98; therefore, we have determined that reporters can use the same information that they have been collecting under 40 CFR part 98 for each subpart to calculate and report GHG information for 2011 and submit reports in 2012 under the amended subparts.

Although the EPA has determined that these amendments can be effective for the calculation of GHG emissions and quantities for the 2011 reporting year, we do note that the EPA is finalizing a limited one-time extension of the 2012 reporting deadline to enable testing of the electronic-GHG Reporting Tool (e-GGRT), which will reflect these amendments. For information on these final amendments and the response to comments on the 2012 deadline, please refer to Section II.A.2 of this preamble.

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<sup>3</sup> 76 FR 74392 (August 4, 2011).

The EPA did not receive any specific comments expressing concern about the implementation of the amendments for 2011 data collection. One commenter encouraged the EPA to develop guidance documents to clarify the changes in the final rule. In addition to the summary of the requirements and rationale in this preamble, we are also updating subpart-specific outreach materials on our website. Technical information and implementation materials can be found on the Greenhouse Gas Reporting Program website

<http://www.epa.gov/climatechange/emissions/ghgrulemaking.html>.

## **II. Final Amendments and Responses to Public Comments**

We are amending various subparts in 40 CFR part 98 to correct errors in the regulatory language that were identified following promulgation of subparts A and OO on October 30, 2009, subparts FF, II, and TT on July 12, 2010, and subparts DD and RR on December 1, 2010. These errors were identified as a result of working with reporters to implement the various subparts of 40 CFR part 98. We are also amending certain rule provisions to provide greater clarity. The amendments to 40 CFR part 98 include the following types of changes:

- Changes to correct cross references within and between subparts.
- Additional information to better or more fully understand compliance obligations in a specific provision, such as the reference to a standardized method that must be followed.

- Amendments to certain equations to better reflect actual operating conditions.
- Corrections to terms and definitions in certain equations.
- Corrections to data reporting requirements so that they more closely conform to the information used to perform calculations.
- Other amendments related to certain issues identified as a result of working with the affected sources during rule implementation and outreach.

Additionally, we are promulgating a one-time, six month extension of the 2012 reporting deadline for facilities and suppliers that contain any source category for which data collection began in 2011. The final amendments promulgated by this action reflect the EPA's consideration of the comments received on the proposal. The major public comments and the EPA's responses for each subpart are provided in this preamble. Our responses to additional significant public comments on the proposal are presented in a comment response document available in Docket ID No. EPA-HQ-OAR-2011-0147.

#### A. Subpart A - General Provisions.

##### 1. Summary of final amendments and major changes since proposal.

The EPA is promulgating several technical clarifications and amendments to subpart A to address issues raised by reporters and identified by the EPA during the early years of implementation of the GHG Reporting Program (GHGRP), as well as to clarify terminology to ensure consistency across all subparts.

Threshold for electrical transmission and distribution equipment use. We are amending Table A-3 in the General Provisions to clarify applicability of the rule for Electrical Transmission and Distribution Equipment Use (subpart DD). Specifically, we are revising the Table A-3 entry for subpart DD to reference the capacity threshold language of 40 CFR 98.301 as follows: Electrical transmission and distribution use at facilities where the total nameplate capacity of SF<sub>6</sub> and PFC containing equipment exceeds 17,820 pounds, as determined under 40 CFR 98.301 (subpart DD). This revision clarifies that only those facilities above the capacity threshold requirements of 40 CFR 98.301 must submit an annual report.

Threshold for underground coal mines. We are revising the threshold for underground coal mines subject to subpart FF to include only those that have ventilation emissions of 36,500,000 acf of CH<sub>4</sub> or more per year. For a full description of this change, please refer to the relevant discussion under subpart FF of this action.

Computation of time. The EPA is adding a provision to 40 CFR 98.3(b) to allow information, including but not limited to, the annual GHG report and any subsequent re-submissions, the certificate of representation, and requests to use best available monitoring methods, to be submitted to the EPA on the next business day in the event that a regulatory deadline falls

on a weekend or a federal holiday. This revision is consistent with a similar provision under the Acid Rain Program (40 CFR 72.11) and provides all reasonable flexibilities for submitting data in a timely manner without compromising program integrity.

2012 reporting deadline. We are promulgating a one-time, six month extension of the 2012 reporting deadline for facilities and suppliers that contain one or more source categories for which data collection began in 2011 (referred to below as the "new 2011 reporting year source categories"), in order to allow sufficient time for development, and more importantly stakeholder testing, of the electronic-GHG Reporting Tool (e-GGRT). The deadline extension from March 31, 2012 to September 28, 2012 applies to any facility that contains one or more of the following source categories in Table A-3 or Table A-4: Electronics Manufacturing (subpart I), Fluorinated Gas Production (subpart L), Magnesium Production (subpart T), Petroleum and Natural Gas Systems (subpart W), Use of Electric Transmission and Distribution Equipment (subpart DD), Underground Coal Mines (subpart FF), Industrial Wastewater Treatment (subpart II), Geologic Sequestration of Carbon Dioxide (subpart RR), Manufacture of Electric Transmission and Distribution (subpart SS), Industrial Waste Landfills (subpart TT), and Injection of Carbon Dioxide (subpart UU). In addition, the extension of the reporting deadline from March 31, 2012 to



September 28, 2012 applies to the following source category in Table A-5: Imports and Exports of Equipment Pre-charged with Fluorinated GHGs or Containing Fluorinated GHGs in Closed-cell Foams (subpart QQ).

The proposed rule would have required these facilities and suppliers to report twice, with the reporting deadline extended to September 28, 2012 only for reporting of GHG information from the new 2011 reporting year source categories included in Tables A-3, A-4 or A-5 of 40 CFR part 98. All other GHG information (e.g., for General Stationary Combustion (subpart C)) would have still been required to be reported in March 2012. The EPA believed that these two separate submission deadlines would be appropriate because the extension was only necessary to allow time for stakeholder testing of e-GGRT for the new 2011 reporting year source categories. Facilities and suppliers had already successfully demonstrated submission of information through e-GGRT for the source categories required to begin data collection in 2010. Therefore, we believed it was appropriate to limit the extension to the reporting of only the new information for the 2011 reporting year.

Based on the comments received on the proposed rule, this final rule extends the reporting deadline to September 28, 2012 for any facility or supplier that contains a new 2011 reporting year source category, and it applies to the reporting of GHG

information from all source categories at their facility. The rationale for this change since proposal is discussed further below in Section II.A.2 of this preamble.

In order for the EPA to identify which facilities and suppliers are subject to this one-time extension of the 2012 reporting deadline, we are requiring that all reporters that submitted an annual GHG report to the EPA for the 2010 reporting year (i.e., submitted their first annual GHG report by September 30, 2011) notify the EPA through e-GGRT by March 31, 2012 that they are not required to submit their second annual GHG report until September 28, 2012. This requirement to notify the EPA by March 31, 2012 does not apply to any facilities or suppliers that are reporting for the first time in 2012.

Reporting on use of Best Available Monitoring Methods (BAMM). We are amending 40 CFR 98.3(c)(7) to remove the phrase "according to paragraph (d) of this section", thereby requiring all facilities and suppliers that use BAMM during the reporting year to provide a brief description of each "best available monitoring method" used, the parameter measured using the method, and the time period during which the "best available monitoring method" was used, if applicable. Through this amendment, we are clarifying that this basic information must be reported for all subparts, including subparts L (Fluorinated Gas Production) and W (Petroleum and Natural Gas Systems). This does

not impact the requirements of subpart I (Electronics Manufacturing), which already directly included this reporting requirement in the data reporting requirements of that subpart.

Definitions. The EPA is revising the definition of supplier, as proposed, in 40 CFR 98.6 so it specifically refers to those source categories listed in Table A-5 of subpart A of part 98, and is as described in the definition of the source category in the applicable subparts. We are also revising 40 CFR 98.1(a)(1), as proposed, to remove the terms "fossil fuel" and "industrial greenhouse gas" from the designation of "supplier."

Submission of reports and other information to the EPA. We are amending 40 CFR 98.9 to clarify that the annual GHG report, the certificate of representation, and all other requests, notifications, or communications must be submitted electronically and in a format as specified by the Administrator. Any information that can be submitted through the electronic GHG reporting tool (e-GGRT) must be submitted through that tool. For example, the EPA is in the process of modifying e-GGRT to accept requests for use of BMM. Once completed, facilities would be required to use that method for submission of BMM requests. The EPA intends to notify facilities well in advance of these, and any future, deadlines through the website (<http://www.epa.gov/climatechange/emissions/ghgrulemaking.html>).

If the format for any request, notification, or communication has not been specified by the EPA, then the information shall be submitted, by mail, to the Director of the Climate Change Division at one of the addresses in 40 CFR 98.9.

Other technical corrections. We are amending 40 CFR 98.2(d) and (e) to remove references to paragraphs 40 CFR 98.2(a)(4)(i) and (a)(4)(ii), respectively. The correct references for both paragraphs should have been to 40 CFR 98.2(a)(4). In those same paragraphs we are clarifying that the applicability determination for importers must be assessed separately from the applicability determination for exporters. In other words, the emissions from the quantity of GHGs imported must be calculated for comparison to the 25,000 metric tons CO<sub>2</sub>e threshold and separately the quantity of GHGs exported must be calculated for comparison to the 25,000 metric tons CO<sub>2</sub>e.

We are amending 40 CFR 98.2(i)(3) to add a date by which owners and operators must notify the EPA that they no longer need to submit an annual GHG report because their operations have changed such that all applicable GHG-emitting processes and operations cease to operate. Similar to the requirements in 40 CFR 98.2(i)(1) and (i)(2), we are requiring owners or operators to notify the EPA by March 31 of the year following the reporting year in which such conditions have been met.

In 40 CFR 98.3(c)(10) and in the definition of United States parent company(s) in 40 CFR 98.6, we are replacing the term "reporting entity" with the term "facility or supplier" for consistency across the individual subparts of the rule and to clarify that the obligation is on the owner or operator of any such facility or supplier.

We are revising the introductory paragraph of 40 CFR 98.3(g) to clarify that the 3-year requirement for retention of records starts from the date of submission of the annual GHG report for the reporting year in which the record was generated.

In 40 CFR 98.3(c)(5)(ii), we are replacing the use of the term "emissions" with "quantities" when referring to the information reported under industrial GHG suppliers. This is consistent with efforts throughout the GHG Reporting Program to clarify that information reported for supplier categories does not necessarily reflect emissions to the atmosphere, but rather "quantities" that may be released if all of the supply were combusted, oxidized, or released.

We are correcting an incorrect cross reference in 40 CFR 98.4(m)(4) from (m)(2)(iv)(A) to (m)(2)(v)(A).

Finally, we are clarifying in Table A-5 that coverage and the applicability determination for importers and exporters under subpart MM includes suppliers of natural gas liquids in addition to suppliers of petroleum products.

## 2. Summary of comments and responses.

This section contains a brief summary of major comments and responses on the proposed amendments to the General Provisions. Several significant comments were received on this topic. Responses to additional comments received can be found in the document, "Response to Comments: 2011 Technical Corrections, Clarifying and Other Amendments to Certain Provisions of the Mandatory Reporting of Greenhouse Gases Rule" (available in Docket ID No.EPA-HQ-OAR-2011-0147).

Comment: Several commenters supported the proposed one-time extension of the reporting date from March 31, 2012 to September 28, 2012 for reporting of data elements under the following source categories: Electronics Manufacturing (subpart I), Fluorinated Gas Production (subpart L), Magnesium Production (subpart T), Petroleum and Natural Gas Systems (subpart W), Use of Electric Transmission and Distribution Equipment (subpart DD), Underground Coal Mines (subpart FF), Industrial Wastewater Treatment (subpart II), Imports and Exports of Equipment Pre-charged with Fluorinated GHGs or Containing Fluorinated GHGs in Closed-cell Foams (subpart QQ), Geologic Sequestration of Carbon Dioxide (subpart RR), Manufacture of Electric Transmission and Distribution (subpart SS), Industrial Waste Landfills (subpart TT), and Injection of Carbon Dioxide (subpart UU). Commenters generally agreed that the extension would provide additional

time for the development and testing of the e-GGRT system for the identified subparts. However, multiple commenters expressed concern about the proposed requirement that only the reporting deadline of the above listed subparts was extended and that facilities would still be required to report GHG information from the non-listed subparts (e.g., subpart C- General Stationary Combustion) by March 31, 2012. For example, some commenters stated that a facility could be required to report emissions for subpart C equipment on March 31, 2012, but would need to provide a second report on September 28, 2012 for equipment under subpart W. At least one commenter questioned how data for subparts A and C would be submitted or split between reporting deadlines for facilities reporting under subpart W. Commenters stated that many facilities, including oil exploration and production companies, already compile significant amounts of data, calculations, and information for reporting. Commenters contended that a second reporting deadline would introduce additional complexity and confusion, duplication of effort, and unnecessary burden to the reporting process.

Other commenters expressed concern on the capabilities of e-GGRT to accommodate multiple submissions. Several commenters stated that when changing input methods between XML upload and manual data entry, the current e-GGRT system overwrites any existing data. At least two commenters expressed concern that

the XML upload feature may not be fully tested and available in time for the September deadline. These commenters reiterated that data submitted in September 2012 must not impact the data submitted in March.

In light of these concerns, several commenters requested that, rather than reporting under two deadlines in 2012, affected facilities or suppliers that have to report under any of the listed subparts (subparts I, L, T, W, DD, FF, II, QQ, RR, SS, TT, and UU) be allowed to report GHG information from all applicable subparts by the September 28, 2012 date.

Response: Although the EPA does not agree with all of the arguments raised by the commenters, we are persuaded that having one reporting deadline for facilities and suppliers in 2012 will not only reduce burden for the reporters, but it also will provide the EPA the opportunity for a more robust stakeholder testing process of e-GGRT, which was the primary purpose of the proposed extension in the first place.

Although many commenters were concerned about the ability of e-GGRT to handle multiple submissions, the EPA believes the process for adding these additional subparts to an annual GHG report has been well tested during the 2011 stakeholder testing process and through resubmissions of 2011 annual reports. For example, facilities are able to add GHG information for a particular subpart into e-GGRT and sign, certify, and submit the



annual GHG report. Subsequent to the submission, the facility is able to go back into e-GGRT, add GHG information for a new subpart, and then again sign, certify, and resubmit the annual GHG report.

Commenters were also concerned that data could be lost if they were to submit information in webforms in March and then XML in September (or vice versa). While it is true that annual GHG reports must be submitted using either webforms or XML, and not both, this issue is not unique to the extension of the proposed reporting deadline. These were the same procedures as for the 2010 reporting year, and facilities and suppliers were able to successfully complete their submissions in 2011.

Although we are confident that e-GGRT can handle the multiple deadlines, we are persuaded that two reporting deadlines could be inefficient for some facilities, depending on the volume and types of data collected during 2011, and the format in which information used for emissions calculations has been retained. This could be particularly true for the large number of facilities reporting for the first time under subpart W (Petroleum and Natural Gas Systems).

In addition to the potential inefficiencies experienced by the reporters, the EPA recognizes after reviewing the comments that the split deadline could impact the ability to comprehensively test e-GGRT, which was the whole point of

proposing the reporting deadline extension for these source categories in the first place. The stakeholder testing process during 2011 was extremely valuable in providing input that enabled the EPA to refine e-GGRT into a user-friendly tool that accurately reflects annual GHG information. It also provided reporters an opportunity to become familiar with the tool, facilitating the reporting process, and improving the quality of data submitted to the EPA. Allowing facilities and suppliers the opportunity to fully test e-GGRT, including the inter-relationship between the new subparts for which data collection began in 2011 (e.g., subparts I and W) and reporting under subpart C, for example, could identify new issues that should be resolved before the reporting deadline.

For these reasons, we agree with the commenters' overall comments and are finalizing an extension of the reporting deadline to September 28, 2012 for any facility or supplier that will also include in their annual GHG report for 2012 a source category for which data collection began in 2011.

In practice, for example, the one-time extension of the 2012 reporting deadline means that a petroleum refinery that has an industrial landfill onsite will not submit their annual GHG report for 2012 until September 28, 2012. A petroleum refinery that does not contain any of these new subparts is still required to report by March 31, 2012. In order to facilitate EPA

verification of the data, and to know which facilities were required to report in March and which facilities do not report until September, the EPA is finalizing a requirement that all facilities or suppliers that submitted their first annual GHG report by September 30, 2011, but are not required to submit their second annual GHG report until September 28, 2012, must log in to e-GGRT by March 31, 2012 and submit a notification through e-GGRT that their facility or supplier is not required to report until September for the 2011 reporting year.

Comment: Two commenters requested a delay in the start of data collection for these new subparts from January 1, 2011 to January 1, 2012, thereby extending the reporting deadline by one year to March 31, 2013. The commenters contended that a six-month extension does not provide adequate time for complex facilities or small businesses to comply with the reporting requirements.

Response: The EPA did not propose to extend the applicability of 40 CFR part 98 in the proposed rule, nor does the EPA find such an extension needed, therefore the EPA disagrees with the comment to postpone the beginning of data collection from January 1, 2011 to January 1, 2012, and subsequently extend the reporting deadline by one year to March 31, 2013. Facilities with source categories for which data collection began in 2011 had the opportunity to request use of

Best Available Monitoring Methods (BAMM) during part or all of 2011, if they could demonstrate that it would not be reasonably feasible to acquire, install, and operate a required piece of monitoring equipment by January 1, 2011. Requests to use BAMM could be used as a bridge to provide the facility sufficient time to come into full compliance with the rule.

Further, since finalization of the rule requirements for these subparts, the EPA has conducted significant stakeholder outreach to convey rule requirements and address questions from industry about the implementation of those requirements. In addition to the Frequently Asked Questions that are posted on our website, the technical corrections, clarifications, and other amendments finalized in this rulemaking are in response to those specific questions. Therefore, we disagree with the commenter and have not extended the reporting deadline to March 31, 2013 for these source categories.

Comment: At least one commenter stated that the proposed changes to 40 CFR 98.9 create confusion for subparts LL and MM. The commenter stated that facilities subject to subparts LL and MM must submit reports using the DCFuels program in place of e-GGRT. Additionally, the DCFuels program allows for mailing of documents. The commenter requested that the use of DCFuels be reflected in 40 CFR 98.9.

Response: The EPA agrees with the commenter that the proposed amendments seemed to apply only to those facilities and suppliers that reported their emissions through e-GGRT. The purpose of these proposed amendments was to be clear that all submissions, notifications and communications must be submitted in a format as specified by the Administrator. It is only where the EPA has not specified a format for a specific submission either required by the EPA or, more likely, initiated by the reporter, that the reporter must submit the information to the mailing address in 40 CFR 98.9. The EPA clarified the rule accordingly. We decided not to mention the specific reporting tools in the regulatory text itself for the straightforward reason that names could change over time. It was not necessary to include specific names of the reporting tools/options, when the real clarification we were making in the proposal was to clarify what type of information must be sent to the mailing address.

Comment: At least one commenter stated that the proposed clarification to 40 CFR 98.3(g) for retention of records, which states that records must be retained for least 3 years from the date of submission of the annual GHG report, would create multiple record retention periods for companies with multiple reporting facilities where reporting submittals are staggered. The commenter stated that these multiple retention periods could

complicate internal reviews and audits. The commenter requested a consistent starting date for all applicable monitoring, recordkeeping, and reporting records.

Response: The amendments to 40 CFR 98.3(g) are intended to reduce multiple retention periods and are consistent with the Acid Rain Program, which reflects the common practice to retain all of the records for a single reporting year in a readily retrievable format, regardless if the record was generated on January 1st or December 31st of that reporting year. Companies with multiple reporting facilities that may stagger submission of annual data prior to the reporting date are encouraged to coordinate with the individual reporting facilities to submit data on the same day if they do not want to track different dates for different facilities. Further, we determined that a single date against which the three-year clock is initiated is not appropriate because some facilities may identify, or be notified by the EPA of, substantive errors in reporting. In the event of a resubmission of an annual GHG report, the three-year recordkeeping retention time would start from the date of the resubmission. This is necessary to ensure that records are maintained for a sufficient period of time so that a history of compliance can be demonstrated and questions about submitted emissions estimates can be resolved, if needed.

B. Subpart W - Petroleum and Natural Gas Systems.

At this time, the EPA is not finalizing the proposed technical corrections, clarifying, and other amendments for the petroleum and natural gas sector under 40 CFR part 98, subpart W. On September 9, 2011, the EPA issued proposed revisions to 40 CFR part 98, subpart W (76 FR 56010). The proposed revisions, identified as a result of working with trade associations and reporters in implementing the rule, would provide further clarification on existing requirements, increase flexibility for certain calculation methods, amend data reporting requirements, clarify terms and definitions, and correct technical and editorial errors.

In order to allow for additional analysis and consideration of comments on the September 9, 2011 proposal that might affect the technical corrections to subpart W proposed on August 4, 2011, the EPA has decided not to finalize these amendments at this time. The EPA is considering the comments submitted for the technical corrections, clarifying, and other amendments regarding subpart W proposed on August 4, 2011, and we will address those comments as we address the comments on the revisions to 40 CFR part 98, subpart W proposed on September 9, 2011 (76 FR 56010).

### C. Subpart FF – Underground Coal Mines.

#### 1. Summary of final amendments and major changes since proposal.

We are promulgating several technical clarifications and

amendments to subpart FF to address questions raised during the first year of promulgation of the rule, as well as clarifications to specified provisions in the rule.

Final changes to subpart A (related to subpart FF). We revised the threshold for underground coal mines to include only those that have ventilation emissions of 36,500,000 acf of CH<sub>4</sub> or more per year. The previous threshold would have required reporting from all underground coal mines that are subject to quarterly or more frequent sampling by MSHA of ventilation systems, regardless of size. The finalized threshold of ventilation emissions of 36,500,000 acf of CH<sub>4</sub> or more per year (equivalent to an average of 100,000 acf of CH<sub>4</sub> or more per day) is more easily identifiable for the coal industry, is consistent with our original intent in terms of coverage, and removes reporting requirements for approximately 500 mines.

Equations FF-1 and FF-3. We are finalizing the amendments, as proposed, to provide clarification for terms in Equations FF-1 and FF-3. In particular, we are clarifying that the variables "V," "MCF," "C," "T," and "P" are not "daily" but "quarterly" rates. We are also changing the units of "V" to cfm instead of scfm and revising the units for "C" to read "%" to allow for the use of "C" on a dry basis.

Sampling for pressure. We have finalized the change allowing facilities to use the annual average barometric



pressure from the nearest NOAA weather service station as a default to measuring ventilation system pressure.

Sampling for moisture content. We have specified, as proposed, that moisture content is measured at the location of the flow meter at least weekly if using CEMS, and at the location and time of the grab sample, if using grab samples.

MSHA data. We have clarified the reporting requirements for temperature, pressure, and moisture content measurements when using MSHA data. We have clarified, as proposed, that moisture content need only be determined when the concentration and flow measurements are made on a different basis (one wet and one dry) and that, if needed, the moisture content must be measured. We have also clarified that temperature must be sampled at the same location and within 7 days of the MSHA samples, and that for pressure, facilities must use either a measured value or the average annual barometric pressure from the nearest NOAA weather service station. We have simplified use of the MSHA data in Equation FF-1 by specifying that the MSHA methane flow data is inserted into Equation FF-1 in place of the value for V and the variables MCF, C/100%, and 1440 are removed from the equation. This clarification eliminates the need to measure moisture when using MSHA methane flow data.

Monitoring equipment. We have included, as proposed, the use of infrared and flame ionization analyzers with the

provision that they be calibrated annually using measurements made by gas chromatography methods.

Also, as proposed, we have clarified several references for consistency with the types of monitoring equipment required. We replaced references to "fuel flow meters" with "flow meters," because the gas that is measured may or may not be used as a fuel. We have also deleted references to "heating value monitors," and "sour gas flow meters" because these monitors and meters are not required.

One change was made in response to public comment. We have changed the requirements for temperature measurements when using MSHA data for ventilation systems. See summary of comments and responses in Section II.C.2 of this preamble.

## 2. Summary of comments and responses.

This section contains a brief summary of major comments and responses. Two comments were received on this topic. Responses to additional significant comments received can be found in the document, "Response to Comments: 2011 Technical Corrections, Clarifying and Other Amendments to Certain Provisions of the Mandatory Reporting of Greenhouse Gases Rule" (see EPA-HQ-OAR-2011-0147).

Comment: One commenter expressed support for the proposed threshold revision. The commenter expressed concern that the EPA's reporting threshold finalized in 2010 (see 75 FR 39736,

July 12, 2010) requiring all underground coal mines, regardless of size, that are subject to quarterly or more frequent sampling by the Mining Safety and Health Administration ("MSHA") of ventilation systems to report GHG emissions would have resulted in a tremendous amount of paperwork and financial burden on these regulated entities. Moreover, the commenter asserted that the threshold would have done little to further the agency's environmental policy objectives.

Response: The EPA agrees with the comment and has finalized the threshold revision, as proposed. For the EPA's rationale for the clarification in the threshold, see the preamble for the proposed rule (76 FR 47400, September 9, 2011).

Comment: Two commenters disagreed with the proposed requirement that facilities collect temperature data at the same time and location as the MSHA samples of volume and concentration of methane. They stated that the EPA should also allow mines to establish temperature data either through readings at a central location in the mine, or potentially through an average annual temperature from the same NOAA weather station. They argued that such a revision would reduce an unnecessary reporting burden.

Response: We agree with the commenters that the temperature reading does not need to take place at the same time as the measurements for volume and concentration of methane.

Ventilation air temperatures at a given location do not change very suddenly, and the temperature could be taken at another time. We disagree with the comment that the EPA should allow temperature to be taken at a centralized location at the mine or at a weather station. The temperature of the ventilation air exiting the mine will not be the same as a local weather station temperature. The ventilation air temperature is dominated by ground temperatures, which do not vary hourly like the weather station temperature. Ventilation air temperature will often vary by mine shaft, as some shafts are deeper than others and some drain more area than others. Due to this variability, the final rule requires temperature to be taken at the same location as the MSHA measurements, as proposed. However, the final rule does not require that the temperature readings be taken at the same time as the MSHA samples, but rather allows these temperature readings to be taken within 7 days of the MSHA measurements for volume and concentration of methane.

#### D. Subpart II - Industrial Wastewater Treatment.

##### 1. Summary of final amendments and major changes since proposal.

We are promulgating clarifying amendments and technical corrections to subpart II to address questions the EPA has received about the rule's requirements, as well as to clarify terminology.

GHGs to report. We are amending 40 CFR 98.352(d) to replace the term "landfill gas" with "biogas" to correct an administrative error.

Calculating GHG emissions. We are amending the definitions of the terms for " $T_m$ " and " $P_m$ " in Equation II-4 to refer to "average temperature" and "average pressure" to clarify how reporters should use the multiple temperature and pressure measurements that they may make during a measurement period. We are also amending these definitions to clarify how the calculation should be adjusted if the flow rate meter automatically corrects for temperature and pressure.

We are amending 40 CFR 98.353(c)(2)(ii), 98.353(c)(2)(iii)(A) and (B), and 40 CFR 98.354(c) and (d) to replace "once each calendar week, with at least three days between measurements" with "at least once each calendar week; if only one measurement is made each calendar week, there must be at least three days between measurements," to clarify what is meant by weekly sampling.

We are amending Equation II-6 of 40 CFR 98.353 to correct an error in the placement of brackets and parentheses. This amendment eliminates the possibility that the equation will return incorrect quantities of methane emissions.

We are amending 40 CFR 98.353(c) to reorder the text to clarify that continuous gas flow monitoring is required for each

anaerobic sludge digester, anaerobic reactor, or anaerobic lagoon from which some biogas is recovered; and to clarify that the continuous gas flow measurements must be used to determine cumulative gas production each week. We are also amending 40 CFR 98.353(c)(1) to replace the term "content" with the term "quantity" to clarify that fully integrated systems report CH<sub>4</sub> quantity which accounts for both CH<sub>4</sub> concentration and biogas flow.

Monitoring and QA/QC requirements. We are amending 40 CFR 98.354(f) by dividing it into subparagraphs and by deleting an incorrect cross reference, to clarify the monitoring requirements for anaerobic sludge digester, anaerobic reactor, or anaerobic lagoon from which some biogas is recovered.

Data reporting requirements. We are amending 40 CFR 98.356(a) by replacing the term "explain" with "indicate" to provide guidance to reporters about the information they should include in the description or diagram of their wastewater treatment system. We are also replacing the term "all anaerobic lagoons" with "each anaerobic lagoon" to clarify that reporters should provide the average depth of each lagoon, not the average of all lagoons.

We are amending 40 CFR 98.356 (b)(3) and (4) to clarify that the values for "B<sub>0</sub>" and "MCF" that are used as inputs to Equation II-1 or II-2, are to be taken from Table II-1. We are

also amending 40 CFR 98.356(d)(2) by replacing the text "Cumulative volumetric biogas flow for each week" with "Total weekly volumetric biogas flow for each week (up to 52 weeks/year)" to clarify that reporters should provide the total gas recovered for the week, for up to 52 weeks per year.

We are amending subpart II, Industrial Wastewater Treatment (40 CFR 98.350 through 40 CFR 98.358), in multiple places, replacing the term "anaerobic digester" with "anaerobic sludge digester" to clarify that the text refers to the anaerobic process defined in 40 CFR 98.350(b)(2); and to replace the term "gas" with "biogas" to clarify the gas referred to is the biogas defined in 40 CFR 98.358.

## 2. Summary of comments and responses.

The EPA did not receive any comments on the proposed amendments to subpart II and is finalizing the amendments to this subpart as proposed.

### E. Subpart OO – Suppliers of Industrial Greenhouse Gases.

#### 1. Summary of final amendments and major changes since proposal.

As proposed, we are amending subpart OO to require that the data currently reported under 40 CFR 98.416(a)(8) and (9) be kept as a record rather than reported. We are making a corresponding revision to 40 CFR 98.416(a)(10).

With these changes, fluorinated GHG and nitrous oxide production facilities will be required to keep dated records of

the total mass in metric tons of each reactant fed into the F-GHG or nitrous oxide production process, by process, and the total mass in metric tons of the reactants, by-products, and other wastes permanently removed from the F-GHG or nitrous oxide production process, by process. They will not be required to report these quantities. Under the revised 40 CFR 98.416(a)(10), they will be required to report the mass in metric tons of any fluorinated GHG or nitrous oxide fed into the transformation process, by process.

## 2. Summary of comments and responses.

Comment: The EPA received three comments from two commenters on the proposed changes to the subpart OO reporting and recordkeeping requirements. Both commenters agreed with the changes, and one commenter agreed with the EPA's rationale. The other commenter stated that the change would make the data available to EPA inspectors if needed, but would protect the data from public disclosure that would compromise reporters' global competitiveness. This commenter requested that the EPA issue a direct final rule to make the changes effective before the September 30, 2011 reporting deadline for 2010 data.

Response: We did not issue a direct final rule to make these changes effective before the September 30, 2011 reporting deadline for 2010 data because we concluded that a direct final action was not appropriate in this case. The data submitted for



2010 under 40 CFR 98.416(a)(8) and (9) has been classified as confidential business information (76 FR 30782, May 26, 2011) and will be afforded protection as CBI. As discussed in the proposed rule, the proposed changes were based on our conclusion that the data elements in 40 CFR 98.416(a)(8) and (9), by themselves, have somewhat limited usefulness for verifying production levels.

#### F. Subpart RR - Geologic Sequestration of Carbon Dioxide.

##### 1. Summary of final amendments and major changes since proposal.

We are promulgating clarifying amendments and technical corrections to subpart RR to correct known errors.

Accounting for CO<sub>2</sub> entrained in produced water. We are amending 40 CFR 98.443(d) to ensure that CO<sub>2</sub> entrained in produced water that is not processed through a gas-liquid separator is accounted for in the mass balance equation. Specifically, we are adding a new sentence to 40 CFR 98.443(d) to account for any CO<sub>2</sub> in fluids that are produced and not processed through a separator. We are also adding a new sentence to 40 CFR 98.443(d)(3) to clarify that the reporter must include additional information regarding the measurement methods used to determine the concentration of CO<sub>2</sub> in fluids, and a discussion of how the amount of produced CO<sub>2</sub> would be determined, in the monitoring, reporting, and verification (MRV) plan. In the MRV

plan, the reporter should describe the disposition of the produced water (reinjecting into another zone, reused, or otherwise disposed) and provide justification for determining whether the CO<sub>2</sub> entrained in the water is sequestered. The MRV plan should also describe considerations the reporter intends to use to calculate CO<sub>2</sub> from produced water for the mass balance equation.

CO<sub>2</sub> Emissions from Equipment Leaks and Vented Emissions of CO<sub>2</sub>. We are amending the term "CO<sub>2</sub> equipment leakage and vented CO<sub>2</sub> emissions" throughout subpart RR so that it reads "CO<sub>2</sub> emissions from equipment leaks and vented emissions of CO<sub>2</sub>."

This change is to ensure consistency with the terminology that is used in 40 CFR part 98, subpart W and to more accurately describe the equipment between flow meters and wellheads for which monitoring requirements are specified in subpart RR.

Specifically, we are amending the following text:

- At 40 CFR 98.442(e) and 98.442(f), revising the term "Mass of CO<sub>2</sub> equipment leakage and vented CO<sub>2</sub> emissions" to read "Mass of CO<sub>2</sub> emissions from equipment leaks and vented emissions of CO<sub>2</sub>."
- In Equations RR-11 and RR-12 at 40 CFR 98.443, revising the term "Total annual CO<sub>2</sub> mass emitted (metric tons) as equipment leakage or vented emissions" to read "Total annual CO<sub>2</sub> mass emitted (metric tons) from equipment leaks and vented emissions of CO<sub>2</sub>."

- At 40 CFR 98.444(d), revising the heading "CO<sub>2</sub> equipment leakage and vented CO<sub>2</sub> emissions" to read "CO<sub>2</sub> emissions from equipment leaks and vented emissions of CO<sub>2</sub>."
- At 40 CFR 98.445(e), revising the term "CO<sub>2</sub> equipment leakage or vented CO<sub>2</sub> emissions" to read "CO<sub>2</sub> emissions from equipment leaks and vented emissions of CO<sub>2</sub>."
- At the introductory text of 40 CFR 98.446(f)(3), revising the term "CO<sub>2</sub> equipment leakage and vented CO<sub>2</sub> emissions" to read "CO<sub>2</sub> emissions from equipment leaks and vented emissions of CO<sub>2</sub>."
- At 40 CFR 98.446(f)(3)(i) and 98.446(f)(3)(ii), revising the term "mass of CO<sub>2</sub> emitted (in metric tons) annually as equipment leakage or vented emissions" to read "mass of CO<sub>2</sub> emitted (in metric tons) annually from equipment leaks and vented emissions of CO<sub>2</sub>."
- At 40 CFR 98.447(a)(5) and 98.447(a)(6), revising the term "CO<sub>2</sub> emitted as equipment leakage or vented emissions" to read "CO<sub>2</sub> emitted from equipment leaks and vented emissions of CO<sub>2</sub>."
- At 40 CFR 98.448(a)(5), revising the term "considerations for calculating equipment leakage and vented emissions" to read "considerations for calculating CO<sub>2</sub> emissions from equipment leaks and vented emissions of CO<sub>2</sub>."

Other technical corrections. We are amending an incorrect cross reference in the introductory language of 40 CFR 98.446(a)(2) and 40 CFR 98.446(a)(3). We are also amending an incorrect cross reference at 40 CFR 98.446(f)(1)(vii). We are also amending the heading of 40 CFR 98.448(e) to correct an administrative error.

We are amending the data reporting element at 40 CFR 98.446(e) and the introductory text at 40 CFR 98.446(f) to provide clarity on when reporters report total amount

sequestered. The amended data reporting element at 40 CFR 98.446(e) reads as follows: "Report the date that you began collecting data for calculating total amount sequestered according to 40 CFR 98.448(a)(7) of this subpart". The amended introductory text at 40 CFR 98.446(f) reads as follows: "Report the following. If the date specified in paragraph (e) of this section is during the reporting year for this annual report, report the following starting on the date specified in paragraph (e) of this section." We are amending the definition of "CO<sub>2</sub> received" at 40 CFR 98.449 to correct a typographical error by adding the word "means" after the CO<sub>2</sub> received defined term. The amended definition reads as follows: "CO<sub>2</sub> received means the CO<sub>2</sub> stream that you receive to be injected for the first time into a well on your facility that is covered by this subpart. CO<sub>2</sub> received includes, but is not limited to, a CO<sub>2</sub> stream from a production process unit inside your facility and a CO<sub>2</sub> stream that was injected into a well on another facility, removed from a discontinued enhanced oil or natural gas or other production well, and transferred to your facility."

## 2. Summary of comments and responses.

The EPA did not receive any comments on the proposed amendments to subpart RR and is finalizing the amendments to this subpart as proposed.

## G. Subpart TT – Industrial Waste Landfills.

### 1. Summary of final amendments and major changes since proposal.

We are promulgating clarifying amendments and technical corrections to subpart TT to address questions the EPA has received about the rule's requirements and to correct known errors.

#### Determining waste-specific DOC values for closed Landfills.

As proposed, we are finalizing amendments to 40 CFR 98.464 by adding a new paragraph (c) to provide methodologies for closed landfills or active landfills that have stopped accepting certain types of wastes to determine the volatile solids concentration (for exemption purposes under 40 CFR 98.460(c)(2)(xii)) or to determine the waste-specific DOC values for historically disposed waste streams. These new methods allow landfills to identify waste streams similar to those that had been historically placed in the landfill, measure the volatile solids concentration of these "similar" waste streams, and use those measured values to assess the applicability of the exemption under paragraph 98.460(c)(2)(xii)) or to determine the average DOC value for the historical waste streams. The proposed provisions also allow use of process knowledge to determine the volatile solids concentration and, if needed, to calculate the corresponding DOC value if a similar waste stream cannot be identified.

Equations for determining volatile solids and DOC values.

As proposed, we are deleting Equation TT-7 and amending Equation TT-8 to 40 CFR 98.464 to correct inadvertent errors in these equations and we are revising the variable "F" in Equation TT-1 and providing a new Equation TT-9 in a new paragraph (g) in 40 CFR 98.464 to correct the measured CH<sub>4</sub> concentration for zero percent oxygen.

Provisions for actively aerated landfills and other amendments to conform with amendments to subpart HH. As proposed, we are amending the definition of the methane correction factor (MCF) to allow landfills with active aeration units to use an MCF value other than the default value of 1 and we are adding 40 CFR 98.466(d)(4) to require reporting of the MCF value and the basis for using an MCF value other than the default value of 1.

As proposed, we are finalizing amendments to define the term "construction and demolition waste landfills" as defined in subpart HH and to use that term rather than "dedicated construction and demolition waste landfills."

We are also finalizing amendments to revise the footnote to Table TT-1 to subpart TT of part 98 to clarify that leachate recirculation rates can be determined from company records or engineering estimates and that the owner or operator of a landfill that uses leachate recirculation may elect to use the k

value for the wet climate rather than calculating the leachate recirculation rate.

Other technical corrections. We are finalizing a number of other technical corrections for subpart TT, as proposed, to correct typographical errors, to correct equations, and to provide minor clarifications. These corrections are summarized below:

- In 40 CFR 98.460(c)(2)(i), replacing "Coal combustion residue (e.g., fly ash)" with "Coal combustion or incinerator ash (e.g., fly ash)."
- In 40 CFR 98.463(a)(1):
  - Revising the definition of  $G_{CH_4}$  to delete the word "rate."
  - Revising the definition of  $DOC_x$  from "degradable organic carbon for year X..." to be "degradable organic carbon for waste disposed in year X..."
- In 40 CFR 98.463(a)(2):
  - Revising "January 1, 1980" to be "January 1, 1960" in both places.
  - Replacing the term "first emissions monitoring year" with "first emissions reporting year."
- In 40 CFR 98.463(a)(2)(ii)(C), deleting the phrase "fixed average annual bulk waste disposal quantity for each year for which historic disposal quantity and" in the paragraph text and adding to the definition of  $W_x$  "This annual bulk waste disposal quantity applies for all years from "YrOpen" to "YrData" inclusive."
- Revising the definition of LFC to allow closed landfills that have some measurement data to appropriately calculate  $W_x$  only for years for which the closed landfill does not have waste disposal data available from company records or from Equation TT-3.
- Revising the definition of YrData in Equation TT-4a to allow closed landfills that have some measurement data to appropriately calculate  $W_x$ .

- Adding Equation TT-4b for use in calculating  $W_x$  when historical waste quantity data are sporadic.
- In 40 CFR 98.464(b), replacing "For each waste stream for which you choose to determine..." with "For each waste stream placed in the landfill during the reporting year for which you choose to determine..."
- In 40 CFR 98.464(b)(1), replacing "Develop and follow a sampling plan to collect a representative sample of each waste stream for which testing is elected" with "Develop and follow a sampling plan to collect a representative sample (in terms of composition and moisture content) of each waste stream placed in the landfill for which testing is elected."
- In 40 CFR 98.464(b)(4), adding the option to use an alternative test procedure published by a consensus-based standards organization to determine an appropriate DOC value using a 60-day anaerobic biodegradation test. We also made conforming edits for reporting and recordkeeping requirements.
- In 40 CFR 98.466(b), replacing "Report the following waste characterization information:" with "Report the following waste characterization and modeling information:".
- Moving paragraphs 40 CFR 98.466(d)(3) and (4) to 98.466(b)(3) and (4).
- In 40 CFR 98.466(b)(2), adding "...for which Equation TT-1 of this subpart is used to calculate modeled  $CH_4$  generation."
- In 40 CFR 98.466(c)(3)(ii), replacing "The year, the waste disposal quantity and production quantity for each year Equation TT-2 applies" with "The year, the waste disposal quantity and production quantity for each year used in Equation TT-2 of this subpart to calculate the average waste disposal factor (WDF)."
- In 40 CFR 98.466(d), adding the phrase "and each year thereafter up" so that the paragraph reads "For each year of landfilling starting with the "Start Year" (S) and each year thereafter up to the current reporting year, report the following information:".
- Adding a new paragraph 40 CFR 98.466(d)(1) to read "The calendar year for which following data elements apply" and renumbering existing paragraphs 98.466(d)(1) and (2) to (d)(2) and (3) and adding the phrase "for the specified year" to ensure the data elements are reported with specified year in the new paragraph 98.466(d)(1).



- In 40 CFR 98.468, adding a definition of "design capacity" to further clarify what is meant by this term as it is used in 40 CFR 98.460.
- In 40 CFR 98.466(f), deleting the word "rate" to conform with revised definition of term and replace it with " $G_{CH_4}$ ".
- In 40 CFR 98.466(f), adding "(MG)" after "methane generation" and replacing "Equation TT-5" with "Equation TT-6".
- In Table TT-1, amending the default value of construction and demolition waste from 0.04 to 0.08.
- In Table TT-1, revising the description of the waste type "Inert Waste" to read "Inert Waste [i.e., wastes listed in 40 CFR 98.460(c)(2)]".

Major changes since proposal. Major changes since proposal are identified in the following list. The rationale for these and any other significant changes can be found in this preamble or the document, "Response to Comments: 2011 Technical Corrections, Clarifying and Other Amendments to Certain Provisions of the Mandatory Reporting of Greenhouse Gases Rule" (see EPA-HQ-OAR-2011-0147).

- Revising the definition YrData to allow closed landfills that have some measurement data to appropriately calculate  $W_x$ .
- Adding Equation TT-4b for use in calculating  $W_x$  when historical waste quantity data are sporadic.
- In 40 CFR 98.464(b)(4), adding the option to use an alternative test procedure published by a consensus-based standards organization to determine an appropriate DOC value using a 60-day anaerobic biodegradation test. We also made conforming edits to the reporting and recordkeeping requirements.
- In 40 CFR 98.468, adding a definition (revised from the proposed definition) of "design capacity" to further clarify what is meant by this term as it is used in 40 CFR 98.460.

## 2. Summary of comments and responses.

This section contains a brief summary of major comments and responses. Several comments were received on subpart TT. Responses to additional significant comments received can be found in the document, "Response to Comments: 2011 Technical Corrections, Clarifying and Other Amendments to Certain Provisions of the Mandatory Reporting of Greenhouse Gases Rule" (see EPA-HQ-OAR-2011-0147).

Comment: We received several comments that the parenthetical phrase "as received at the landfill" to 40 CFR 98.464(b)(1) does more than clarify that closed landfills are not to be sampled, it also appears to prevent foundries from testing individual waste streams that are commingled prior to receipt at the landfill.

Response: It was not our intent to prevent the testing of individual waste streams. In fact, the definition of waste stream clearly indicates that, for facilities with an on-site landfill, a waste stream is "the industrial solid waste material generated by a specific processing unit at the landfill." We agree that the term "as received" can be misinterpreted. Therefore, we are using the term "placed in the landfill" rather than "as received at the landfill" and adding "(in terms of composition and moisture content)" after "representative sample"

to clarify that the sampling must be done for the waste stream as it is initially disposed of, which excludes sampling of waste in-place at a closed landfill. Together with the definition of waste stream in 40 CFR 98.468, these amendments clearly apply to the sampling and evaluation of individual waste streams.

Comment: One commenter noted that the revised definition of the term YrData in Equation TT-4 does not adequately allow the calculation of waste quantities when measurement data are available for some historical years but when there are data gaps before and after these years.

Response: When we developed Equation TT-4, we envisioned that facilities would generally have data for the most recent historical years and would only be estimating waste quantities for the years prior to when data were available. Equation TT-4 is not well suited to address the situation where waste quantity data are available from company records or Equation TT-3 for sporadic, non-consecutive years. To address this issue, we have re-named Equation TT-4 to be Equation TT-4a, and limited the use of Equation TT-4a to those instances where data are available consecutively for the most recent disposal years. When data are available for sporadic years, we have added a separate equation (Equation TT-4b) that can be used to estimate the missing annual waste quantities.

Comment: One commenter stated that the proposed revisions to the equations and terms related to determining volatile solids concentration and waste stream-specific DOC values can still yield incorrect DOC values because some substances, such as plastics or activated carbon, would have high volatile solids concentration but should not have significant degradable organic carbon content. The commenter suggested that alternative anaerobic biodegradation tests available from consensus-based standards organizations be allowed as an alternative to the volatile solids-based estimation method, noting these types of tests were used as the basis of  $F_{\text{DOC}}$  value used in Equation TT-8. The commenter presented results of a 90-day anaerobic biodegradation test to support their claim that coke contained in an inorganic waste sample would not anaerobically degrade. Alternatively, the commenter recommended specifically listing titanium oxide waste in 40 CFR 98.460(c)(2).

Response: We reviewed available methods for evaluating the anaerobic biodegradability of waste materials. While we expect that these methods are likely to be more accurate in situations like those identified by the commenter, a short-duration test may not fully determine the amount of carbon that could be degraded over decades within a landfill. Based on our review of various anaerobic biodegradation rate tests, we have provided for the use of anaerobic biodegradation tests following methods

developed by consensus-based standards organizations. We have specified certain test requirements (minimum of 60 days; four test samples) and quality assurance objectives for determining DOC values based on these anaerobic biodegradation tests.

Comment: We received several comments regarding the proposed definition of "design capacity". Some commenters suggested that, based on the definition, unpermitted landfills or landfills that do not have a permitted capacity limit do not have a "design capacity" and are therefore not covered by the rule. The commenters requested clarification on this issue. Another commenter questioned the need to determine a site-specific waste density and recalculate the design capacity annually.

Response: First, we did not intend to limit the applicability of the rule to only those landfills that have a permitted capacity limit; we merely intended to allow facilities that have permitted capacities to use their permitted capacity rather than the maximum volume of waste that could be disposed of in the area of the landfill. We have revised the definition of design capacity so that the first sentence simply reads "Design capacity means the maximum amount of solid waste a landfill can accept." The second paragraph retains the clarification that the design capacity can be determined in terms of volume or mass in the most recent permit. For landfills

without a permitted capacity limit, the design capacity should be determined based on the physical limitations, in terms of the total area available for waste disposal and potential waste depth of the landfill.

With respect to the need to re-evaluate the site-specific waste density annually, we agree with the commenter that this measurement is required under very limited circumstances, namely to determine applicability. For most landfills, the design capacity will be significantly smaller or larger than the 300,000 metric tons threshold value provided in 40 CFR 98.460(a). Therefore, only those landfill facilities that have design capacities near 300,000 metric tons would need to re-evaluate their design capacities. We also agree that the design capacity need only be re-evaluated if there is a change in the process that can reasonably be expected to alter the site-specific waste density. Therefore, we have limited the requirement to re-determine site-specific waste density and resultant design capacity to those cases where the current design capacity is within 10 percent of the 300,000 metric tons threshold value in 40 CFR 98.460(a) <sup>and</sup> there is a process change that can reasonably be expected to change the site-specific waste density.

### **III. Statutory and Executive Order Reviews**

A. Executive Order 12866: Regulatory Planning and Review and Executive Order 13563: Improving Regulation and Regulatory Review.

This action is not a "significant regulatory action" under the terms of Executive Order 12866 (58 FR 51735, October 4, 1993) and is therefore not subject to review under Executive Orders 12866 and 13563 (76 FR 3821, January 21, 2011).

B. Paperwork Reduction Act.

This action does not impose any new information collection burden. The amendments are administrative in nature and do not increase the recordkeeping and reporting burden associated with Part 98. However, the Office of Management and Budget (OMB) has previously approved the information collection request (ICR) for subparts A and OO contained in the regulations promulgated on October 30, 2009 (EPA ICR number 2300.03; OMB control number 2060-0629), subpart DD promulgated on December 1, 2010 (EPA ICR number 2373.02; OMB control number 2060-0650), subparts FF, II and TT promulgated on July 12, 2010 (EPA ICR number 2396.01; OMB control number 2060-0647), and subpart RR promulgated on December 1, 2010 (EPA ICR number 2372.02; OMB control number 2060-0649) under 40 CFR part 98 under the provisions of the Paperwork Reduction Act, 44 U.S.C. 3501 et seq. The OMB control numbers for the EPA's regulations in 40 CFR are listed in 40 CFR part 9. EPA has submitted change worksheets for the respective

ICRs to OMB to reflect the clarifications to the reporting requirements finalized in this rule. Further information on the EPA's assessment on the impact on burden can be found in the Technical Corrections and Amendments Cost Memo in docket number EPA-HQ-OAR-2011-0147.

### C. Regulatory Flexibility Act (RFA).

The Regulatory Flexibility Act (RFA) generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedure Act or any other statute unless the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small organizations, and small governmental jurisdictions.

For purposes of assessing the impacts of this final rule on small entities, small entity is defined as: (1) a small business as defined by the Small Business Administration's regulations at 13 CFR 121.201; (2) a small governmental jurisdiction that is a government of a city, county, town, school district or special district with a population of less than 50,000; and (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field. This definition of small entity is consistent with the definition of small entity used for Part 98.



After considering the economic impacts of these final rule amendments on small entities, I certify that this action will not have a significant economic impact on a substantial number of small entities. These rule amendments will not impose any new requirement on small entities that are not currently required by the regulation of subparts A and OO promulgated on October 30, 2009; subparts FF, II, and TT promulgated on July 12, 2010; or subparts DD or RR, both promulgated on December 1, 2010. The amendments to 40 CFR part 98 are administrative in nature and do not increase the costs for small entities to comply with Part 98. Therefore, this final rule does not have a significant economic impact on a substantial number of small entities.

The EPA took several steps to reduce the impact of 40 CFR part 98 on small entities when developing the final GHG reporting rules in 2009 and 2010. For example, the EPA determined appropriate thresholds that reduced the number of small businesses reporting. In addition, the EPA conducted several meetings with industry associations to discuss regulatory options and the corresponding burden on industry, such as recordkeeping and reporting. Finally, the EPA continues to conduct significant outreach on the GHG reporting program and maintains an "open door" policy for stakeholders to help inform the EPA's understanding of key issues for the industries.

D. Unfunded Mandates Reform Act (UMRA).

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), 2 U.S.C. 1531-1538, requires federal agencies, unless otherwise prohibited by law, to assess the effects of their regulatory actions on state, local, and tribal governments and the private sector. Federal agencies must also develop a plan to provide notice to small governments that might be significantly or uniquely affected by any regulatory requirements. The plan must enable officials of affected small governments to have meaningful and timely input in the development of EPA regulatory proposals with significant federal intergovernmental mandates and must inform, educate, and advise small governments on compliance with the regulatory requirements.

The final rule amendments do not contain a federal mandate that may result in expenditures of \$100 million or more for state, local, and tribal governments, in the aggregate, or the private sector in any one year. Thus, the final rule amendments are not subject to the requirements of section 202 and 205 of the UMRA. This rule is also not subject to the requirements of section 203 of UMRA because it contains no regulatory requirements that might significantly or uniquely affect small governments. These amendments will not impose any new requirements that are not currently required for 40 CFR part 98, and the rule amendments would not unfairly apply to small

governments. Therefore, this action is not subject to the requirements of section 203 of the UMRA.

E. Executive Order 13132: Federalism.

The final rule amendments to Part 98 do not have federalism implications. They will not have substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132.

These amendments apply directly to facilities that directly emit greenhouse gases, facilities that supply certain products that would result in GHGs when released, combusted or oxidized, and facilities that geologically sequester or otherwise inject CO<sub>2</sub> underground. They do not apply to governmental entities unless the government entity owns a facility that directly emits GHGs above threshold levels (such as a landfill), so relatively few government facilities would be affected. This regulation also does not limit the power of states or localities to collect GHG data and/or regulate GHG emissions. Thus, Executive Order 13132 does not apply to this action.

Although section 6 of Executive Order 13132 does not apply to this action, the EPA did consult with state and local officials or representatives of state and local governments in developing subparts A and OO promulgated on October 30, 2009;

subparts FF, II, and TT promulgated on July 12, 2010; and subparts DD and RR, both promulgated on December 1, 2010. A summary of the EPA's consultations with state and local governments is provided in Section VIII.E of the preamble to the 2009 final rule.

In the spirit of Executive Order 13132, and consistent with the EPA policy to promote communications between the EPA and state and local governments, the EPA specifically solicited comments on the proposed action from state and local officials. The EPA did not receive any comments on the proposed action from state and local officials.

F. Executive Order 13175: Consultation and Coordination with Indian Tribal Governments

This action does not have tribal implications, as specified in Executive Order 13175 (65 FR 67249, November 9, 2000). The final rule amendments do not result in any changes to the current requirements of 40 CFR part 98. Thus, Executive Order 13175 does not apply to this action.

Although Executive Order 13175 does not apply to this action, the EPA sought opportunities to provide information to tribal governments and representatives during the development of the rules for subparts A and OO promulgated on October 30, 2009; subparts FF, II, and TT promulgated on July 12, 2010, and subparts DD and RR, both promulgated on December 1, 2010. A

summary of the EPA's consultations with tribal officials is provided in Sections VIII.D and VIII.F of the preamble to the 2009 final rule.

G. Executive Order 13045: Protection of Children from Environmental Health Risks and Safety Risks.

The EPA interprets Executive Order 13045 (62 FR 19885, April 23, 1997) as applying only to those regulatory actions that concern health or safety risks, such that the analysis required under section 5-501 of the Executive Order has the potential to influence the regulation. This action is not subject to Executive Order 13045 because it does not establish an environmental standard intended to mitigate health or safety risks.

H. Executive Order 13211: Actions that Significantly Affect Energy Supply, Distribution, or Use.

This action is not subject to Executive Order 13211 (66 FR 28355, May 22, 2001), because it is not a significant regulatory action under Executive Order 12866.

I. National Technology Transfer and Advancement Act.

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (NTTAA), Public Law No. 104-113 (15 U.S.C. 272 note) directs the EPA to use voluntary consensus standards in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical.

Voluntary consensus standards are technical standards (e.g., materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standards bodies. NTTAA directs the EPA to provide Congress, through OMB, explanations when the agency decides not to use available and applicable voluntary consensus standards.

The final rule amendments do not involve technical standards. Therefore, the EPA did not consider the use of any voluntary consensus standards.

J. Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.

Executive Order 12898 (59 FR 7629, February 16, 1994) establishes federal executive policy on environmental justice. Its main provision directs federal agencies, to the greatest extent practicable and permitted by law, to make environmental justice part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations in the United States.

The EPA has determined that these final rule amendments will not have disproportionately high and adverse human health or environmental effects on minority or low-income populations

because it does not affect the level of protection provided to human health or the environment because it is a rule addressing information collection and reporting procedures.

K. Congressional Review Act.

The Congressional Review Act, 5 U.S.C. 801 et seq., as added by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), generally provides that before a rule may take effect, the agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the Congress and to the Comptroller General of the United States. The EPA will submit a report containing this rule and other required information to the U.S. Senate, the U.S. House of Representatives, and the Comptroller General of the U.S. prior to publication of the rule in the Federal Register. A major rule cannot take effect until 60 days after it is published in the Federal Register. This action is not a "major rule" as defined by 5 U.S.C. 804(2). This rule will be effective on [INSERT THE DATE 30 DAYS AFTER PUBLICATION OF THIS FINAL RULE IN THE FEDERAL REGISTER].

**List of Subjects in 40 CFR Part 98**

Environmental protection, Administrative practice and procedure, Greenhouse gases, Suppliers, Reporting and recordkeeping requirements.

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Dated: November 9, 2011.

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Lisa P. Jackson,  
Administrator.



For the reasons stated in the preamble, part 98 of title 40, chapter I, of the Code of Federal Regulations is amended as follows:

**PART 98—[AMENDED]**

1. The authority citation for part 98 continues to read as follows:

**Authority:** 42 U.S.C. 7401-7671q.

2. Section 98.1 is amended by revising paragraph (a) to read as follows:

**Subpart A—[Amended]**

§98.1 Purpose and scope.

(a) This part establishes mandatory greenhouse gas (GHG) reporting requirements for owners and operators of certain facilities that directly emit GHG as well as for certain suppliers. For suppliers, the GHGs reported are the quantity that would be emitted from combustion or use of the products supplied.

\* \* \* \* \*

3. Section 98.2 is amended by:

- a. Revising paragraph (d).
- b. Revising paragraph (e).
- c. Revising paragraph (f) introductory text.
- d. Revising paragraph (h).
- e. Revising paragraph (i) (3).

## §98.2 Who must report?

\* \* \* \* \*

(d) To calculate GHG quantities for comparison to the 25,000 metric ton CO<sub>2</sub> per year threshold for importers and exporters of coal-to-liquid products under paragraph (a)(4) of this section, calculate the mass in metric tons per year of CO<sub>2</sub> that would result from the complete combustion or oxidation of the quantity of coal-to-liquid products that are imported during the reporting year and, that are exported during the reporting year. Compare the imported quantities and the exported quantities separately to the 25,000 metric ton CO<sub>2</sub> per year threshold. Calculate the quantities using the methodology specified in subpart LL of this part.

(e) To calculate GHG quantities for comparison to the 25,000 metric ton CO<sub>2</sub>e per year threshold for importers and exporters of petroleum products under paragraph (a)(4) of this section, calculate the mass in metric tons per year of CO<sub>2</sub> that would result from the complete combustion or oxidation of the combined volume of petroleum products and natural gas liquids that are imported during the reporting year and that are exported during the reporting year. Compare the imported quantities and the exported quantities separately to the 25,000 metric ton CO<sub>2</sub> per year threshold. Calculate the quantities using the methodology specified in subpart MM of this part.

(f) To calculate GHG quantities for comparison to the 25,000 metric ton CO<sub>2</sub>e per year threshold under paragraph (a) (4) of this section for importers and exporters of industrial greenhouse gases and for importers and exporters of CO<sub>2</sub>, the owner or operator shall calculate the mass in metric tons per year of CO<sub>2</sub>e imports and exports as described in paragraphs (f) (1) through (f) (3) of this section. Compare the imported quantities and the exported quantities separately to the 25,000 metric ton CO<sub>2</sub> per year threshold.

\* \* \* \* \*

(h) An owner or operator of a facility or supplier that does not meet the applicability requirements of paragraph (a) of this section is not subject to this rule. Such owner or operator would become subject to the rule and reporting requirements, if a facility or supplier exceeds the applicability requirements of paragraph (a) of this section at a later time pursuant to §98.3(b) (3). Thus, the owner or operator should reevaluate the applicability to this part (including the revising of any relevant emissions calculations or other calculations) whenever there is any change that could cause a facility or supplier to meet the applicability requirements of paragraph (a) of this section. Such changes include but are not limited to process modifications, increases in operating hours, increases in

production, changes in fuel or raw material use, addition of equipment, and facility expansion.

(i) \* \* \*

(3) If the operations of a facility or supplier are changed such that all applicable GHG-emitting processes and operations listed in paragraphs (a)(1) through (a)(4) of this section cease to operate, then the owner or operator is exempt from reporting in the years following the year in which cessation of such operations occurs, provided that the owner or operator submits a notification to the Administrator that announces the cessation of reporting and certifies to the closure of all GHG-emitting processes and operations no later than March 31 of the year following such changes. This paragraph (i)(3) does not apply to seasonal or other temporary cessation of operations. This paragraph (i)(3) does not apply to facilities with municipal solid waste landfills or industrial waste landfills, or to underground coal mines. The owner or operator must resume reporting for any future calendar year during which any of the GHG-emitting processes or operations resume operation.

\* \* \* \* \*

4. Section 98.3 is amended by:

- a. Revising paragraph (b) introductory text.
- b. Adding paragraph (b)(1).
- c. Adding paragraph (b)(4).

- d. Revising paragraph (c) (5) (ii) .
- e. Revising paragraph (c) (7) .
- f. Revising paragraph (c) (10) .
- g. Revising paragraph (c) (11) .
- h. Revising the second sentence of paragraph (g)

introductory text.

§98.3 What are the general monitoring, reporting, recordkeeping and verification requirements of this part?

\* \* \* \* \*

(b) Schedule. The annual GHG report for reporting year 2010 must be submitted no later than September 30, 2011. The annual report for reporting years 2011 and beyond must be submitted no later than March 31 of each calendar year for GHG emissions in the previous calendar year, except as provided in paragraph (b) (1) of this section.

(1) For reporting year 2011, facilities with one or more of the subparts listed in paragraphs (b) (1) (i) through (b) (1) (xi) of this section and suppliers listed in paragraph (b) (1) (xii) of this section are required to submit their annual GHG report no later than September 28, 2012. Facilities and suppliers that are submitting their second annual GHG report in 2012 and that are reporting on one or more subparts listed in paragraphs (b) (1) (i) through (b) (1) (xii) of this section must notify EPA by

March 31, 2012 that they are not required to submit their annual GHG report until September 28, 2012.

- (i) Electronics Manufacturing (subpart I).
- (ii) Fluorinated Gas Production (subpart L).
- (iii) Magnesium Production (subpart T).
- (iv) Petroleum and Natural Gas Systems (subpart W).
- (v) Use of Electric Transmission and Distribution Equipment (subpart DD).
- (vi) Underground Coal Mines (subpart FF).
- (vii) Industrial Wastewater Treatment (subpart II).
- (viii) Geologic Sequestration of Carbon Dioxide (subpart RR).
- (ix) Manufacture of Electric Transmission and Distribution (subpart SS).
- (x) Industrial Waste Landfills (subpart TT).
- (xi) Injection of Carbon Dioxide (subpart UU).
- (xii) Imports and Exports of Equipment Pre-charged with Fluorinated GHGs or Containing Fluorinated GHGs in Closed-cell Foams (subpart QQ).

\* \* \* \* \*

(4) Unless otherwise stated, if the final day of any time period falls on a weekend or a federal holiday, the time period shall be extended to the next business day.

(c) \* \* \*

(5) \* \* \*

(ii) Quantity of each GHG from each applicable supply category in Table A-5 to this subpart, expressed in metric tons of each GHG. For fluorinated GHG, report quantities of all fluorinated GHG, including those not listed in Table A-1 to this subpart.

\* \* \* \* \*

(7) A brief description of each "best available monitoring method" used, the parameter measured using the method, and the time period during which the "best available monitoring method" was used, if applicable.

\* \* \* \* \*

(10) NAICS code(s) that apply to the facility or supplier.

(i) Primary NAICS code. Report the NAICS code that most accurately describes the facility or supplier's primary product/activity/service. The primary product/activity/service is the principal source of revenue for the facility or supplier. A facility or supplier that has two distinct products/activities/services providing comparable revenue may report a second primary NAICS code.

(ii) Additional NAICS code(s). Report all additional NAICS codes that describe all product(s)/activity(s)/service(s) at the facility or supplier that are not related to the principal source of revenue.

(11) Legal name(s) and physical address(es) of the highest-level United States parent company(s) of the owners (or operators) of the facility or supplier and the percentage of ownership interest for each listed parent company as of December 31 of the year for which data are being reported according to the following instructions:

(i) If the facility or supplier is entirely owned by a single United States company that is not owned by another company, provide that company's legal name and physical address as the United States parent company and report 100 percent ownership.

(ii) If the facility or supplier is entirely owned by a single United States company that is, itself, owned by another company (e.g., it is a division or subsidiary of a higher-level company), provide the legal name and physical address of the highest-level company in the ownership hierarchy as the United States parent company and report 100 percent ownership.

(iii) If the facility or supplier is owned by more than one United States company (e.g., company A owns 40 percent, company B owns 35 percent, and company C owns 25 percent), provide the legal names and physical addresses of all the highest-level companies with an ownership interest as the United States parent companies, and report the percent ownership of each company.



(iv) If the facility or supplier is owned by a joint venture or a cooperative, the joint venture or cooperative is its own United States parent company. Provide the legal name and physical address of the joint venture or cooperative as the United States parent company, and report 100 percent ownership by the joint venture or cooperative.

(v) If the facility or supplier is entirely owned by a foreign company, provide the legal name and physical address of the foreign company's highest-level company based in the United States as the United States parent company, and report 100 percent ownership.

(vi) If the facility or supplier is partially owned by a foreign company and partially owned by one or more U.S. companies, provide the legal name and physical address of the foreign company's highest-level company based in the United States, along with the legal names and physical addresses of the other U.S. parent companies, and report the percent ownership of each of these companies.

(vii) If the facility or supplier is a federally owned facility, report "U.S. Government" and do not report physical address or percent ownership.

\* \* \* \* \*

(g) Recordkeeping. \* \* \* Retain all required records for at least 3 years from the date of submission of the annual

GHG report for the reporting year in which the record was generated. \* \* \*

\* \* \* \* \*

5. Section 98.4 is amended by revising paragraph (m) (4) to read as follows:

§98.4 Authorization and responsibilities of the designated representative.

\* \* \* \* \*

(m) \* \* \*

(4) Any electronic submission covered by the certification in paragraph (m) (2) (v) (A) of this section and made in accordance with a notice of delegation effective under paragraph (m) (3) of this section shall be deemed to be an electronic submission certified, signed, and submitted by the designated representative or alternate designated representative submitting such notice of delegation.

6. Section 98.6 is amended by revising the definitions of "Supplier" and "United States parent company(s)" to read as follows:

§98.6 Definitions.

\* \* \* \* \*

Supplier means a producer, importer, or exporter in any supply category included in Table A-5 to this subpart, as defined by the corresponding subpart of this part.

\* \* \* \* \*

United States parent company(s) means the highest-level United States company(s) with an ownership interest in the facility or supplier as of December 31 of the year for which data are being reported.

\* \* \* \* \*

7. Section 98.9 introductory text is revised to read as follows:

§98.9 Addresses.

All requests, notifications, and communications to the Administrator pursuant to this part must be submitted electronically and in a format as specified by the Administrator. For example, any requests, notifications and communications that can be submitted through the electronic GHG reporting tool, must be submitted through that tool. If not specified, requests, notifications or communications shall be submitted to the following address:

\* \* \* \* \*

8. Table A-3 to subpart A is amended by revising the entry for "Electrical transmission and distribution equipment use" and "Underground coal mines" to read as follows:

**Table A-3 to Subpart A of Part 98—Source Category List for §98.2(a)(1)**

<b>Source Categories<sup>a</sup> Applicable in 2010 and Future Years</b>
* * * * *
<b>Additional Source Categories<sup>a</sup> Applicable in 2011 and Future Years</b>
Electrical transmission and distribution equipment use at facilities where the total nameplate capacity of SF <sub>6</sub> and PFC containing equipment exceeds 17,820 pounds, as determined under §98.301 (subpart DD).
Underground coal mines liberating 36,500,000 actual cubic feet of CH <sub>4</sub> or more per year (subpart FF).
* * * * *

<sup>a</sup> Source categories are defined in each applicable subpart.

9. Table A-5 to subpart A is amended by revising the entries for "Petroleum product suppliers (subpart MM)" to read as follows:

**Table A-5 to Subpart A of Part 98 —Supplier Category List for §98.2(a)(4)**

<b>Supplier Categories<sup>a</sup> Applicable in 2010 and Future Years</b>
* * * * *

Petroleum product suppliers (subpart MM):

(A) All petroleum refineries that distill crude oil.

(B) Importers of an annual quantity of petroleum products and natural gas liquids that is equivalent to 25,000 metric tons CO<sub>2</sub>e or more.

(C) Exporters of an annual quantity of petroleum products and natural gas liquids that is equivalent to 25,000 metric tons CO<sub>2</sub>e or more.

\* \* \* \* \*

<sup>a</sup>Suppliers are defined in each applicable subpart.

**Subpart FF—[Amended]**

10. Section 98.322 is amended by revising paragraph (f) to read as follows:

§98.322 GHGs to report.

\* \* \* \* \*

(f) An underground coal mine that is subject to this part because emissions from source categories described in Tables A-3, A-4 or A-5 of subpart A of this part, or from stationary combustion (subpart C of this part), is not required to report emissions under this subpart unless the coal mine liberates 36,500,000 actual cubic feet (acf) or more of methane per year from its ventilation system.

11. Section 98.323 is amended by:

a. Revising the definitions of "V", "C", and "P" in Equation FF-1 of paragraph (a).

b. Revising the first sentence of paragraph (a)(2).

c. Revising the definitions of "Vi", "Ci", "Ti", and "Pi" in Equation FF-3 of paragraph (b) introductory text.

d. Revising the first sentence of paragraph (b)(1).

e. Revising paragraph (c) introductory text preceding Eq. FF-5.

The revisions read as follows:

§98.323 Calculating GHG emissions.

(a) \* \* \*

V = Volumetric flow rate for the quarter (cfm) based on sampling or a flow rate meter. If a flow rate meter is used and the meter automatically corrects for temperature and pressure, replace " $520^{\circ}\text{R}/T \times P/1 \text{ atm}$ " with "1".

\* \* \*

C = CH<sub>4</sub> concentration of ventilation gas for the quarter (%).

\* \* \*

P = Pressure at which flow is measured (atm) for the quarter. The annual average barometric pressure from the nearest NOAA weather service station may be used as a default.

\* \* \*

(2) Values of V, C, T, P, and (fH<sub>2</sub>O), if applicable, must be based on measurements taken at least once each quarter with no fewer than 6 weeks between measurements. \* \* \*

\* \* \*

(b) \* \* \*

$V_i$  = Measured volumetric flow rate for the days in the week when the degasification system is in operation at that monitoring point, based on sampling or a flow rate meter (cfm). If a flow rate meter is used and the meter automatically corrects for temperature and pressure, replace " $520^{\circ}\text{R}/T_i \times P_i/1 \text{ atm}$ " with "1".

\* \* \*

$C_i$  =  $\text{CH}_4$  concentration of gas for the days in the week when the degasification system is in operation at that monitoring point (%).

\* \* \*

$T_i$  = Temperature at which flow is measured ( $^{\circ}\text{R}$ ).

$P_i$  = Pressure at which flow is measured (atm).

\* \* \*

(1) Values for  $V$ ,  $C$ ,  $T$ ,  $P$ , and ( $f_{\text{H}_2\text{O}}$ ), if applicable, must be based on measurements taken at least once each calendar week with at least 3 days between measurements. \* \* \*

\* \* \*

(c) If gas from degasification system wells or ventilation shafts is sold, used onsite, or otherwise destroyed (including by flaring), you must calculate the quarterly  $\text{CH}_4$  destroyed for each destruction device and each point of offsite transport to a destruction device, using Equation FF-5 of this section. You must measure  $\text{CH}_4$  content and flow rate according to the provisions in §98.324, and calculate the methane routed to the destruction device ( $\text{CH}_4$ ) using either Equation FF-1 or Equation FF-3 of this section, as applicable.

\* \* \* \* \*

12. Section 98.324 is amended by:

- a. Revising paragraphs (b) (1) and (b) (2) .
- b. Revising paragraph (c) .
- c. Revising paragraph (d) .
- d. Revising paragraph (e) introductory text.
- e. Revising paragraphs (g) and (h) .

The revisions read as follows:

§98.324 Monitoring and QA/QC requirements.

\* \* \* \* \*

(b) \* \* \*

(1) Collect quarterly or more frequent grab samples (with no fewer than 6 weeks between measurements) for methane concentration and make quarterly measurements of flow rate, temperature, pressure, and moisture content, if applicable. The sampling and measurements must be made at the same locations as Mine Safety and Health Administration (MSHA) inspection samples are taken, and should be taken when the mine is operating under normal conditions. You must follow MSHA sampling procedures as set forth in the MSHA Handbook entitled, General Coal Mine Inspection Procedures and Inspection Tracking System Handbook Number: PH-08-V-1, January 1, 2008 (incorporated by reference, see §98.7). You must record the date of sampling, flow, temperature, pressure, and moisture measurements, the methane



concentration (percent), the bottle number of samples collected, and the location of the measurement or collection.

(2) Obtain results of the quarterly (or more frequent) testing performed by MSHA for the methane flowrate. At the same location and within seven days of the MSHA sampling, make measurements of temperature and pressure using the same procedures specified in paragraph (b)(1) of this section. The annual average barometric pressure from the nearest National Oceanic and Atmospheric Administration (NOAA) weather service station may be used as a default for pressure. If the MSHA data for methane flow is provided in the units of actual cubic feet of methane per day, the methane flow data is inserted into Equation FF-1 of this section in place of the value for V and the variables MCF, C/100%, and 1440 are removed from the equation.

\* \* \* \* \*

(c) For CH<sub>4</sub> liberated at degasification systems, determine whether CH<sub>4</sub> will be monitored from each well and gob gas vent hole, from a centralized monitoring point, or from a combination of the two options. Operators are allowed flexibility for aggregating emissions from more than one well or gob gas vent hole, as long as emissions from all are addressed, and the methodology for calculating total emissions is documented.

Monitor both gas volume and methane concentration by one of the following two options:

(1) Monitor emissions through the use of one or more continuous emissions monitoring systems (CEMS). If operators use CEMS as the basis for emissions reporting, they must provide documentation on the process for using data obtained from their CEMS to estimate emissions from their mine ventilation systems.

(2) Collect weekly (once each calendar week, with at least three days between measurements) or more frequent samples, for all degasification wells and gob gas vent holes. Determine weekly or more frequent flow rates, methane concentration, temperature, and pressure from these degasification wells and gob gas vent holes. Methane composition should be determined either by submitting samples to a lab for analysis, or from the use of methanometers at the degasification well site. Follow the sampling protocols for sampling of methane emissions from ventilation shafts, as described in §98.324(b)(1). You must record the date of sampling, flow, temperature, pressure, and moisture measurements, the methane concentration (percent), the bottle number of samples collected, and the location of the measurement or collection.

(3) If the CH<sub>4</sub> concentration is determined on a dry basis and flow is determined on a wet basis or CH<sub>4</sub> concentration is determined on a wet basis and flow is determined on a dry basis,

and the flow meter does not automatically correct for moisture content, determine the moisture content in the gas in a location near or representative of the location of:

(i) The gas flow meter at least once each calendar week; if measuring with CEMS. If only one measurement is made each calendar week, there must be at least three days between measurements; and

(ii) The grab sample, if using grab samples, at the time of the sample.

(d) Monitoring must adhere to one of the methods specified in paragraphs (d)(1) through (d)(2) of this section.

(1) ASTM D1945-03, Standard Test Method for Analysis of Natural Gas by Gas Chromatography; ASTM D1946-90 (Reapproved 2006), Standard Practice for Analysis of Reformed Gas by Gas Chromatography; ASTM D4891-89 (Reapproved 2006), Standard Test Method for Heating Value of Gases in Natural Gas Range by Stoichiometric Combustion; or ASTM UOP539-97 Refinery Gas Analysis by Gas Chromatography (incorporated by reference, see §98.7).

(2) As an alternative to the gas chromatography methods provided in paragraph (d)(1) of this section, you may use gaseous organic concentration analyzers and a correction factor to calculate the CH<sub>4</sub> concentration following the requirements in paragraphs (d)(2)(i) through (d)(2)(iii) of this section.

(i) Use Method 25A or 25B at 40 CFR part 60, appendix A-7 to determine gaseous organic concentration as required in §98.323 and in paragraphs (b) and (c) of this section. You must calibrate the instrument with CH<sub>4</sub> and determine the total gaseous organic concentration as carbon (or as CH<sub>4</sub>; K=1 in Equation 25A-1 of Method 25A at 40 CFR part 60, appendix A-7).

(ii) Determine a correction factor that will be used with the gaseous organic concentrations measured in paragraph (i) of this section. The correction factor must be determined at the routine sampling location no less frequently than once a reporting year following the requirements in paragraphs (d)(2)(ii)(A) through (d)(2)(ii)(C) of this section.

(A) Take a minimum of three grab samples of the gas with a minimum of 20 minutes between samples and determine the methane composition of the gas using one of the methods specified in paragraph (d)(1) of this section.

(B) As soon as practical after each grab sample is collected and prior to the collection of a subsequent grab sample, determine the gaseous organic concentration of the gas using either Method 25A or 25B at 40 CFR part 60, appendix A-7 as specified in paragraph (d)(2)(i) of this section.

(C) Determine the arithmetic average methane concentration and the arithmetic average gaseous organic concentration of the samples analyzed according to paragraphs (d)(2)(ii)(A) and

(d)(2)(ii)(B) of this section, respectively, and calculate the non-methane organic carbon correction factor as the ratio of the average methane concentration to the average total gaseous organic concentration. If the ratio exceeds 1, use 1 for the correction factor.

(iii) Calculate the CH<sub>4</sub> concentration as specified in Equation FF-9 of this section:

$$C_{CH_4} = f_{NMOC} \times C_{TGOC} \quad (\text{Eq. FF-9})$$

Where:

$C_{CH_4}$  = Methane (CH<sub>4</sub>) concentration in the gas (volume %) for use in Equations FF-1 and FF-3 of this subpart.

$f_{NMOC}$  = Correction factor from the most recent determination of the correction factor as specified in paragraph (d)(2)(ii) of this section (unitless).

$C_{TGOC}$  = Gaseous organic carbon concentration measured using Method 25A or 25B at 40 CFR part 60, appendix A-7 during routine monitoring of the gas (volume %).

(e) All flow meters and gas composition monitors that are used to provide data for the GHG emissions calculations shall be calibrated prior to the first reporting year, using the applicable methods specified in paragraphs (d), and (e)(1) through (e)(7) of this section. Alternatively, calibration procedures specified by the flow meter manufacturer may be used. Flow meters and gas composition monitors shall be recalibrated either at the minimum frequency specified by the manufacturer or annually. The operator shall operate, maintain, and calibrate a gas composition monitor capable of measuring the concentration

of CH<sub>4</sub> in the gas using one of the methods specified in paragraph (d) of this section. The operator shall operate, maintain, and calibrate the flow meter using any of the following test methods or follow the procedures specified by the flow meter manufacturer. Flow meters must meet the accuracy requirements in §98.3(i).

\* \* \* \* \*

(g) All temperature, pressure, and moisture content monitors must be operated and calibrated using the procedures and frequencies specified by the manufacturer.

(h) If applicable, the owner or operator shall document the procedures used to ensure the accuracy of gas flow rate, gas composition, temperature, pressure, and moisture content measurements. These procedures include, but are not limited to, calibration of flow meters, and other measurement devices. The estimated accuracy of measurements, and the technical basis for the estimated accuracy shall be recorded.

13. Section 98.325 is amended by revising the first sentence of paragraph (b) as to read follows:

§98.325 Procedures for estimating missing data.

\* \* \* \* \*

(b) For each missing value of CH<sub>4</sub> concentration, flow rate, temperature, pressure, and moisture content for ventilation and degasification systems, the substitute data value shall be the

arithmetic average of the quality-assured values of that parameter immediately preceding and immediately following the missing data incident. \* \* \*

14. Section 98.326 is amended by:

- a. Revising paragraph (f).
- b. Revising paragraph (h).
- c. Revising paragraph (j).
- d. Revising paragraph (k).
- e. Revising paragraph (o).

The revisions read as follows:

§98.326 Data reporting requirements.

\* \* \* \* \*

(f) Quarterly volumetric flow rate for each ventilation monitoring point (scfm), date and location of each measurement, and method of measurement (quarterly sampling or continuous monitoring), used in Equation FF-1 of this subpart.

\* \* \* \* \*

(h) Weekly volumetric flow rate used to calculate CH<sub>4</sub> liberated from degasification systems (cfm) and method of measurement (sampling or continuous monitoring), used in Equation FF-3 of this subpart.

\* \* \* \* \*

(j) Weekly volumetric flow rate used to calculate CH<sub>4</sub> destruction for each destruction device and each point of offsite transport (cfm).

(k) Weekly CH<sub>4</sub> concentration (%) used to calculate CH<sub>4</sub> flow to each destruction device and each point of offsite transport (C).

\* \* \* \* \*

(o) Temperatures (°R), pressure (atm), and moisture content used in Equation FF-1 and FF-3 of this subpart, and the gaseous organic concentration correction factor, if Equation FF-9 was required.

\* \* \* \* \*

#### **Subpart II—[Amended]**

15. Section 98.350 is amended by revising the first sentence of paragraph (b) introductory text to read as follows:

§98.350 Definition of source category.

\* \* \* \* \*

(b) An anaerobic process is a procedure in which organic matter in wastewater, wastewater treatment sludge, or other material is degraded by micro-organisms in the absence of oxygen, resulting in the generation of CO<sub>2</sub> and CH<sub>4</sub>. \* \* \*

\* \* \* \* \*

16. Section 98.352 is amended by revising paragraph (d) to read as follows:



§98.352 GHGs to report.

\* \* \* \*

(d) You must report under subpart C of this part (General Stationary Fuel Combustion Sources) the emissions of CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O from each stationary combustion unit associated with the biogas destruction device, if present, by following the requirements of subpart C of this part.

17. Section 98.353 is amended by:

- a. Revising paragraph (a)(2) introductory text.
- b. Revising paragraph (c) introductory text and paragraph (c)(1) introductory text preceding Equation II-4.
- c. Revising the definitions of "Rn", "Tm", and "Pm" in Equation II-4 of paragraph (c)(1).
- d. Revising paragraph (c)(2).
- e. Revising paragraph (d) introductory text.
- f. Revising the definition of "Rn" in Equation II-5 in paragraph (d)(1).
- g. Revising paragraph (d)(2) introductory text preceding Equation II-6.
- h. Revising Equation II-6 and revising the definition of "CH<sub>4</sub>E<sub>n</sub>", "R<sub>n</sub>", "DE<sub>1</sub>", and "f<sub>Dest\_1</sub>" in paragraph (d)(2).

§98.353 Calculating GHG emissions.

(a) \* \* \*

(2) If you measure the concentration of organic material entering an anaerobic reactor or anaerobic lagoon using methods for the determination of 5-day biochemical oxygen demand ( $BOD_5$ ), then estimate annual mass of  $CH_4$  generated using Equation II-2 of this section.

$$CH_4G_n = \sum_{w=1}^{52} [Flow_w * BOD_{5,w} * B_o * MCF * 0.001] \quad (\text{Eq. II-2})$$

Where:

- $CH_4G_n$  = Annual mass of  $CH_4$  generated from the anaerobic wastewater treatment process (metric tons).
- $n$  = Index for processes at the facility, used in Equation II-7.
- $w$  = Index for weekly measurement period.
- $Flow_w$  = Volume of wastewater sent to an anaerobic wastewater treatment process in week  $w$  ( $m^3/\text{week}$ ), measured as specified in §98.354(d).
- $BOD_{5,w}$  = Average weekly concentration of 5-day biochemical oxygen demand of wastewater entering an anaerobic wastewater treatment process for week  $w$  ( $kg/m^3$ ), measured as specified in §98.354(b) and (c).
- $B_o$  = Maximum  $CH_4$  producing potential of wastewater ( $kg\ CH_4/kg\ BOD_5$ ), use the value 0.6.
- $MCF$  =  $CH_4$  conversion factor, based on relevant values in Table II-1 to this subpart.
- 0.001 = Conversion factor from kg to metric tons.

\* \* \* \* \*

(c) For each anaerobic sludge digester, anaerobic reactor, or anaerobic lagoon from which some biogas is recovered, estimate the annual mass of  $CH_4$  recovered according to the requirements in paragraphs (c)(1) and (c)(2) of this section. To

estimate the annual mass of CH<sub>4</sub> recovered, you must continuously monitor biogas flow rate and determine the volume of biogas each week and the cumulative volume of biogas each year that is collected and routed to a destruction device as specified in §98.354(h). If the gas flow meter is not equipped with automatic correction for temperature, pressure, or, if necessary, moisture content, you must determine these parameters as specified in paragraph (c)(2)(ii) of this section.

(1) If you continuously monitor CH<sub>4</sub> concentration (and if necessary, temperature, pressure, and moisture content required as specified in §98.354(f)) of the biogas that is collected and routed to a destruction device using a monitoring meter specifically for CH<sub>4</sub> gas, as specified in §98.354(g), you must use this monitoring system and calculate the quantity of CH<sub>4</sub> recovered for destruction using Equation II-4 of this section. A fully integrated system that directly reports CH<sub>4</sub> quantity requires only the summing of results of all monitoring periods for a given year.

\* \* \* \* \*

R<sub>n</sub> = Annual quantity of CH<sub>4</sub> recovered from the nth anaerobic reactor, sludge digester, or lagoon (metric tons CH<sub>4</sub>/yr)

\* \* \* \* \*

T<sub>m</sub> = Average temperature at which flow is measured for the measurement period(°R). If the flow rate meter

automatically corrects for temperature to 520° R,  
replace "520° R/T<sub>m</sub>" with "1".

P<sub>m</sub> = Average pressure at which flow is measured for the  
measurement period (atm). If the flow rate meter  
automatically corrects for pressure to 1 atm, replace  
"P<sub>m</sub>/1" with "1".

\* \* \* \* \*

(2) If you do not continuously monitor CH<sub>4</sub> concentration  
according to paragraph(c) (1) of this section, you must determine  
the CH<sub>4</sub> concentration, temperature, pressure, and, if necessary,  
moisture content of the biogas that is collected and routed to a  
destruction device according to the requirements in paragraphs  
(c) (2) (i) through (c) (2) (ii) of this section and calculate the  
quantity of CH<sub>4</sub> recovered for destruction using Equation II-4 of  
this section.

(i) Determine the CH<sub>4</sub> concentration in the biogas that is  
collected and routed to a destruction device in a location near  
or representative of the location of the gas flow meter at least  
once each calendar week; if only one measurement is made each  
calendar week, there must be least three days between  
measurements. For a given calendar week, you are not required to  
determine CH<sub>4</sub> concentration if the cumulative volume of biogas  
for that calendar week, determined as specified in paragraph (c)  
of this section, is zero.

(ii) If the gas flow meter is not equipped with automatic correction for temperature, pressure, or, if necessary, moisture content:

(A) Determine the temperature and pressure in the biogas that is collected and routed to a destruction device in a location near or representative of the location of the gas flow meter at least once each calendar week; if only one measurement is made each calendar week, there must be at least three days between measurements.

(B) If the CH<sub>4</sub> concentration is determined on a dry basis and biogas flow is determined on a wet basis, or CH<sub>4</sub> concentration is determined on a wet basis and biogas flow is determined on a dry basis, and the flow meter does not automatically correct for moisture content, determine the moisture content in the biogas that is collected and routed to a destruction device in a location near or representative of the location of the gas flow meter at least once each calendar week that the cumulative biogas flow measured as specified in §98.354(h) is greater than zero; if only one measurement is made each calendar week, there must be at least three days between measurements.

(d) For each anaerobic sludge digester, anaerobic reactor, or anaerobic lagoon from which some quantity of biogas is recovered, you must estimate both the annual mass of CH<sub>4</sub> that is

generated, but not recovered, according to paragraph (d)(1) of this section and the annual mass of CH<sub>4</sub> emitted according to paragraph (d)(2) of this section.

(1) \* \* \*

R<sub>n</sub> = Annual quantity of CH<sub>4</sub> recovered from the nth anaerobic reactor, anaerobic lagoon, or anaerobic sludge digester, as calculated in Equation II-4 of this section (metric tons CH<sub>4</sub>).

\* \* \*

(2) For each anaerobic sludge digester, anaerobic reactor, or anaerobic lagoon from which some quantity of biogas is recovered, estimate the annual mass of CH<sub>4</sub> emitted using Equation II-6 of this section.

$$\text{CH}_4\text{E}_n = \text{CH}_4\text{L}_n + \text{R}_n (1 - [(DE_1 * f_{Dest\_1}) + (DE_2 * f_{Dest\_2})])$$

(Eq. II-6)

Where:

CH<sub>4</sub>E<sub>n</sub> = Annual quantity of CH<sub>4</sub> emitted from the process n from which biogas is recovered (metric tons).

\* \* \*

R<sub>n</sub> = Annual quantity of CH<sub>4</sub> recovered from the nth anaerobic reactor or anaerobic sludge digester, as calculated in Equation II-4 of this section (metric tons CH<sub>4</sub>).

DE<sub>1</sub> = Primary destruction device CH<sub>4</sub> destruction efficiency (lesser of manufacturer's specified destruction efficiency and 0.99). If the biogas is transported off-site for destruction, use DE=1.

f<sub>Dest\_1</sub> = Fraction of hours the primary destruction device was operating (device operating hours/hours in the year).

If the biogas is transported off-site for destruction,  
use  $f_{\text{Dest}}=1$ .

\* \* \* \* \*

18. Section 98.354 is amended by:

- a. Revising the second sentence of paragraph (c).
- b. Revising paragraph (d) introductory text.
- c. Revising paragraph (f).
- d. Revising paragraph (g) introductory text.
- e. Revising paragraph (h) introductory text and paragraph (h) (5).
- f. Revising paragraph (k).

§98.354 Monitoring and QA/QC requirements.

(c) \* \* \* You must collect and analyze samples for COD or BOD<sub>5</sub> concentration at least once each calendar week that the anaerobic wastewater treatment process is operating; if only one measurement is made each calendar week, there must be at least three days between measurements. \* \* \*

(d) You must measure the flowrate of wastewater entering anaerobic wastewater treatment process at least once each calendar week that the process is operating; if only one measurement is made each calendar week, there must be at least three days between measurements. You must measure the flowrate for the 24-hour period for which you collect samples analyzed for COD or BOD<sub>5</sub> concentration. The flow measurement location must correspond to the location used to collect samples analyzed for

COD or BOD<sub>5</sub> concentration. You must measure the flowrate using one of the methods specified in paragraphs (d)(1) through (d)(5) of this section or as specified by the manufacturer.

\* \* \* \* \*

(f) For each anaerobic process (such as anaerobic reactor, sludge digester, or lagoon) from which biogas is recovered, you must make the measurements or determinations specified in paragraphs (f)(1) through (f)(3) of this section.

(1) You must continuously measure the biogas flow rate as specified in paragraph (h) of this section and determine the cumulative volume of biogas recovered.

(2) You must determine the CH<sub>4</sub> concentration of the recovered biogas as specified in paragraph (g) of this section at a location near or representative of the location of the gas flow meter. You must determine CH<sub>4</sub> concentration either continuously or intermittently. If you determine the concentration intermittently, you must determine the concentration at least once each calendar week that the cumulative biogas flow measured as specified in paragraph (h) of this section is greater than zero, with at least three days between measurements.

(3) As specified in §98.353(c) and paragraph (h) of this section, you must determine temperature, pressure, and moisture content as necessary to accurately determine the biogas flow



rate and CH<sub>4</sub> concentration. You must determine temperature and pressure if the gas flow meter or gas composition monitor do not automatically correct for temperature or pressure. You must measure moisture content of the recovered biogas if the biogas flow rate is measured on a wet basis and the CH<sub>4</sub> concentration is measured on a dry basis. You must also measure the moisture content of the recovered biogas if the biogas flow rate is measured on a dry basis and the CH<sub>4</sub> concentration is measured on a wet basis.

(g) For each anaerobic process (such as an anaerobic reactor, sludge digester, or lagoon) from which biogas is recovered, operate, maintain, and calibrate a gas composition monitor capable of measuring the concentration of CH<sub>4</sub> in the recovered biogas using one of the methods specified in paragraphs (g) (1) through (g) (6) of this section or as specified by the manufacturer.

\* \* \* \* \*

(h) For each anaerobic process (such as an anaerobic reactor, sludge digester, or lagoon) from which biogas is recovered, install, operate, maintain, and calibrate a gas flow meter capable of continuously measuring the volumetric flow rate of the recovered biogas using one of the methods specified in paragraphs (h) (1) through (h) (8) of this section or as specified by the manufacturer. Recalibrate each gas flow meter either

biennially (every 2 years) or at the minimum frequency specified by the manufacturer. Except as provided in §98.353(c)(2)(iii), each gas flow meter must be capable of correcting for the temperature and pressure and, if necessary, moisture content.

\* \* \* \* \*

(5) ASME MFC-11M-2006 Measurement of Fluid Flow by Means of Coriolis Mass Flowmeters (incorporated by reference, see §98.7). The mass flow must be corrected to volumetric flow based on the measured temperature, pressure, and biogas composition.

\* \* \* \* \*

(k) If applicable, the owner or operator must document the procedures used to ensure the accuracy of measurements of COD or BOD<sub>5</sub> concentration, wastewater flow rate, biogas flow rate, biogas composition, temperature, pressure, and moisture content. These procedures include, but are not limited to, calibration of gas flow meters, and other measurement devices. The estimated accuracy of measurements made with these devices must also be recorded, and the technical basis for these estimates must be documented.

19. Section 98.355 is amended by revising paragraph (b) to read as follows:

§98.355 Procedures for estimating missing data

\* \* \* \* \*

(b) For each missing value of the CH<sub>4</sub> content or biogas flow rates, the substitute data value must be the arithmetic average of the quality-assured values of that parameter immediately preceding and immediately following the missing data incident.

\* \* \* \* \*

20. Section 98.356 is amended by:

a. Revising paragraph (a) introductory text.

b. Revising paragraphs (b) (3) and (b) (4).

c. Revising paragraph (d) introductory text and paragraphs (d) (2), (d) (4), (d) (6), and (d) (8).

§98.356 Data reporting requirements.

\* \* \* \* \*

(a) A description or diagram of the industrial wastewater treatment system, identifying the processes used to treat industrial wastewater and industrial wastewater treatment sludge. Indicate how the processes are related to each other and identify the anaerobic processes. Provide a unique identifier for each anaerobic process, indicate the average depth in meters of each anaerobic lagoon, and indicate whether biogas generated by each anaerobic process is recovered. The anaerobic processes must be identified as:

\* \* \* \* \*

(b) \* \* \*

(3) Maximum CH<sub>4</sub> production potential (B<sub>0</sub>) used as an input to Equation II-1 or II-2 of this subpart, from Table II-1 to this subpart.

(4) Methane conversion factor (MCF) used as an input to Equation II-1 or II-2 of this subpart, from Table II-1 to this subpart.

\* \* \* \* \*

(d) For each anaerobic wastewater treatment process and anaerobic sludge digester from which some biogas is recovered, you must report:

\* \* \* \* \*

(2) Total weekly volumetric biogas flow for each week (up to 52 weeks/year) that biogas is collected for destruction.

\* \* \* \* \*

(4) Weekly average biogas temperature for each week at which flow is measured for biogas collected for destruction, or statement that temperature is incorporated into monitoring equipment internal calculations.

\* \* \* \* \*

(6) Weekly average biogas pressure for each week at which flow is measured for biogas collected for destruction, or statement that pressure is incorporated into monitoring equipment internal calculations.

\* \* \* \* \*

(8) Whether destruction occurs at the facility or off-site. If destruction occurs at the facility, also report whether a back-up destruction device is present at the facility, the annual operating hours for the primary destruction device, the annual operating hours for the back-up destruction device (if present), the destruction efficiency for the primary destruction device, and the destruction efficiency for the back-up destruction device (if present).

\* \* \* \* \*

**Subpart 00—[Amended]**

21. Section 98.416 is amended by removing and reserving paragraphs (a) (8) and (a) (9) and revising paragraph (a) (10) to read as follows:

§98.416 Data reporting requirements.

\* \* \* \* \*

(a) \* \* \*

(8) [Reserved]

(9) [Reserved]

(10) Mass in metric tons of any fluorinated GHG or nitrous oxide fed into the transformation process, by process.

\* \* \* \* \*

22. Section 98.417 is amended by adding paragraphs (a) (3) and (a) (4) to read as follows:

§98.417 Records that must be retained.

(a) \* \* \*

(3) Dated records of the total mass in metric tons of each reactant fed into the F-GHG or nitrous oxide production process, by process.

(4) Dated records of the total mass in metric tons of the reactants, by-products, and other wastes permanently removed from the F-GHG or nitrous oxide production process, by process.

\* \* \* \* \*

**Subpart RR- [Amended]**

23. Section 98.442 is amended by revising paragraphs (e) and (f) to read as follows:

§98.442 GHGs to report.

\* \* \* \* \*

(e) Mass of CO<sub>2</sub> emissions from equipment leaks and vented emissions of CO<sub>2</sub> from surface equipment located between the injection flow meter and the injection wellhead.

(f) Mass of CO<sub>2</sub> emissions from equipment leaks and vented emissions of CO<sub>2</sub> from surface equipment located between the production flow meter and the production wellhead.

\* \* \* \* \*

24. Section 98.443 is amended by:

- a. Revising paragraph (d) introductory text.
- b. Revising paragraph (d)(3) introductory text.

c. Revising the definition of "CO<sub>2FI</sub>" and "CO<sub>2FP</sub>" in Equation RR-11 of paragraph (f)(1).

d. Revising the definition of "CO<sub>2FI</sub>" in Equation RR-12 of paragraph (f)(2).

§98.443 Calculating CO<sub>2</sub> geologic sequestration.

\* \* \* \* \*

(d) You must calculate the annual mass of CO<sub>2</sub> produced from oil or gas production wells or from other fluid wells for each separator that sends a stream of gas into a recycle or end use system in accordance with the procedures specified in paragraphs (d)(1) through (d)(3) of this section. You must account for any CO<sub>2</sub> that is produced and not processed through a separator. You must account only for wells that produce the CO<sub>2</sub> that was injected into the well or wells covered by this source category.

\* \* \* \* \*

(3) To aggregate production data, you must sum the mass of all of the CO<sub>2</sub> separated at each gas-liquid separator in accordance with the procedure specified in Equation RR-9 of this section. You must assume that the total CO<sub>2</sub> measured at the separator(s) represents a percentage of the total CO<sub>2</sub> produced. In order to account for the percentage of CO<sub>2</sub> produced that is estimated to remain with the produced oil or other fluid, you must multiply the quarterly mass of CO<sub>2</sub> measured at the separator(s) by a percentage estimated using a methodology in

your approved MRV plan. If fluids containing CO<sub>2</sub> from injection wells covered under this source category are produced and not processed through a gas-liquid separator, the concentration of CO<sub>2</sub> in the produced fluids must be measured at a flow meter located prior to reinjection or reuse using methods in §98.444(f)(1). The considerations you intend to use to calculate CO<sub>2</sub> from produced fluids for the mass balance equation must be described in your approved MRV plan in accordance with §98.448(d)(5).

$$CO_{2P} = (1+X) * \sum_{w=1}^W CO_{2,w} \quad (\text{Eq. RR-9})$$

Where:

CO<sub>2P</sub> = Total annual CO<sub>2</sub> mass produced (metric tons) through all separators in the reporting year.

CO<sub>2,w</sub> = Annual CO<sub>2</sub> mass produced (metric tons) through separator w in the reporting year.

X = Entrained CO<sub>2</sub> in produced oil or other fluid divided by the CO<sub>2</sub> separated through all separators in the reporting year (weight percent CO<sub>2</sub>, expressed as a decimal fraction).

w = Separator.

(f) \* \* \*

(1) \* \* \*

\* \* \* \* \*

CO<sub>2FI</sub> = Total annual CO<sub>2</sub> mass emitted (metric tons) from equipment leaks and vented emissions of CO<sub>2</sub> from equipment located on the surface between the flow meter used to measure injection quantity and the



injection wellhead, for which a calculation procedure is provided in subpart W of this part.

CO<sub>2FP</sub> = Total annual CO<sub>2</sub> mass emitted (metric tons) from equipment leaks and vented emissions of CO<sub>2</sub> from equipment located on the surface between the production wellhead and the flow meter used to measure production quantity, for which a calculation procedure is provided in subpart W of this part.

(2) \* \* \*

\* \* \* \* \*

CO<sub>2FI</sub> = Total annual CO<sub>2</sub> mass emitted (metric tons) from equipment leaks and vented emissions of CO<sub>2</sub> from equipment located on the surface between the flow meter used to measure injection quantity and the injection wellhead.

25. Section 98.444 is amended by revising the heading of paragraph (d) to read as follows:

§98.444 Monitoring and QA/QC requirements.

\* \* \* \* \*

(d) CO<sub>2</sub> emissions from equipment leaks and vented emissions of CO<sub>2</sub>. \* \* \*

\* \* \* \* \*

26. Section 98.445 is amended by revising paragraph (e) to read as follows:

§98.445 Procedures for estimating missing data.

\* \* \* \* \*

(e) For any values associated with CO<sub>2</sub> emissions from equipment leaks and vented emissions of CO<sub>2</sub> from surface equipment at the facility that are reported in this subpart,

missing data estimation procedures should be followed in accordance with those specified in subpart W of this part.

\* \* \* \* \*

27. Section 98.446 is amended by:

a. Revising paragraph (a) (2) introductory text and (a) (3) introductory text.

b. Revising paragraph (e).

c. Revising paragraph (f) introductory text.

d. Revising paragraph (f) (1) (vii).

e. Revising paragraph (f) (3).

§98.446 Data reporting requirements.

\* \* \* \* \*

(a) \* \* \*

(2) If a volumetric flow meter is used to receive CO<sub>2</sub> report the following unless you reported yes to paragraph (a) (4) of this section:

\* \* \* \* \*

(3) If a mass flow meter is used to receive CO<sub>2</sub> report the following unless you reported yes to paragraph (a) (4) of this section:

\* \* \* \* \*

(e) Report the date that you began collecting data for calculating total amount sequestered according to §98.448(a) (7) of this subpart.

(f) Report the following. If the date specified in paragraph (e) of this section is during the reporting year for this annual report, report the following starting on the date specified in paragraph (e) of this section.

(1) \* \* \*

(vii) The standard used to calculate each value in paragraphs (f)(1)(ii) through (f)(1)(iv) of this section.

\* \* \* \* \*

(3) For CO<sub>2</sub> emissions from equipment leaks and vented emissions of CO<sub>2</sub>, report the following:

(i) The mass of CO<sub>2</sub> emitted (in metric tons) annually from equipment leaks and vented emissions of CO<sub>2</sub> from equipment located on the surface between the flow meter used to measure injection quantity and the injection wellhead.

(ii) The mass of CO<sub>2</sub> emitted (in metric tons) annually from equipment leaks and vented emissions of CO<sub>2</sub> from equipment located on the surface between the production wellhead and the flow meter used to measure production quantity.

\* \* \* \* \*

28. Section 98.447 is amended by revising paragraphs

(a)(5) and (a)(6) to read as follows:

§98.447 Records that must be retained.

(a) \* \* \*

(5) Annual records of information used to calculate the CO<sub>2</sub> emitted from equipment leaks and vented emissions of CO<sub>2</sub> from equipment located on the surface between the flow meter used to measure injection quantity and the injection wellhead.

(6) Annual records of information used to calculate the CO<sub>2</sub> emitted from equipment leaks and vented emissions of CO<sub>2</sub> from equipment located on the surface between the production wellhead and the flow meter used to measure production quantity.

\* \* \* \* \*

29. Section 98.448 is amended by revising paragraphs

(a) (5) and (e) to read as follows:

§98.448 Geologic sequestration monitoring, reporting, and verification (MRV) plan.

(a) \* \* \*

(5) A summary of the considerations you intend to use to calculate site-specific variables for the mass balance equation. This includes, but is not limited to, considerations for calculating CO<sub>2</sub> emissions from equipment leaks and vented emissions of CO<sub>2</sub> between the injection flow meter and injection well and/or the production flow meter and production well, and considerations for calculating CO<sub>2</sub> in produced fluids.

\* \* \* \* \*

(e) Revised MRV plan. The requirements of paragraph (c) of this section apply to any submission of a revised MRV plan. You

must continue reporting under your currently approved plan while awaiting approval of a revised MRV plan.

\* \* \* \* \*

30. Section 98.449 is amended by revising the definition of "CO<sub>2</sub> received" to read as follows:

§98.449 Definitions.

\* \* \* \* \*

CO<sub>2</sub> received means the CO<sub>2</sub> stream that you receive to be injected for the first time into a well on your facility that is covered by this subpart. CO<sub>2</sub> received includes, but is not limited to, a CO<sub>2</sub> stream from a production process unit inside your facility and a CO<sub>2</sub> stream that was injected into a well on another facility, removed from a discontinued enhanced oil or natural gas or other production well, and transferred to your facility.

\* \* \* \* \*

**Subpart TT- [Amended]**

31. Section 98.460 is amended by revising paragraphs (c) (1) and (c) (2) (i) to read as follows:

§98.460 Definition of the source category.

\* \* \* \* \*

(c) \* \* \*

(1) Construction and demolition waste landfills.

(2) \* \* \*

(i) Coal combustion or incinerator ash (e.g., fly ash).

\* \* \* \* \*

32. Section 98.463 is amended by:

- a. Revising paragraph (a) (1).
- b. Revising paragraph (a) (2) introductory text.
- c. Revising paragraph (a) (2) (ii) (C).

§98.463 Calculating GHG emissions.

(a) \* \* \*

(1) Calculate annual modeled CH<sub>4</sub> generation using Equation TT-1 of this section.

$$G_{CH_4} = \left[ \sum_{x=S}^{T-1} \left\{ W_x \times DOC_x \times MCF \times DOC_F \times F \times \frac{16}{12} \times \left( e^{-k(T-x-1)} - e^{-k(T-x)} \right) \right\} \right] \quad (\text{Eq. TT-1})$$

Where:

- G<sub>CH<sub>4</sub></sub> = Modeled methane generation in reporting year T (metric tons CH<sub>4</sub>).
- X = Year in which waste was disposed.
- S = Start year of calculation. Use the year 1960 or the opening year of the landfill, whichever is more recent.
- T = Reporting year for which emissions are calculated.
- W<sub>x</sub> = Quantity of waste disposed in the industrial waste landfill in year X from measurement data and/or other company records (metric tons, as received (wet weight)).
- DOC<sub>x</sub> = Degradable organic carbon for waste disposed in year X from Table TT-1 to this subpart or from measurement data [as specified in paragraph (a) (3) of this section], if available [fraction (metric tons C/metric ton waste)].
- DOC<sub>F</sub> = Fraction of DOC dissimilated (fraction); use the default value of 0.5.

- MCF = Methane correction factor (fraction). Use the default value of 1 unless there is active aeration of waste within the landfill during the reporting year. If there is active aeration of waste within the landfill during the reporting year, use either the default value of 1 or select an alternative value no less than 0.5 based on site-specific aeration parameters.
- $F_x$  = Fraction by volume of  $CH_4$  in landfill gas (fraction, dry basis, corrected to 0% oxygen). If you have a gas collection system, use the annual average  $CH_4$  concentration from measurement data for the current reporting year; otherwise, use the default value of 0.5.
- k = Decay rate constant from Table TT-1 to this subpart (yr<sup>-1</sup>). Select the most applicable k value for the majority of the past 10 years (or operating life, whichever is shorter).

(2) Waste stream quantities. Determine annual waste quantities as specified in paragraphs (a)(2)(i) through (ii) of this section for each year starting with January 1, 1960 or the year the landfills first accepted waste if after January 1, 1960, up until the most recent reporting year. The choice of method for determining waste quantities will vary according to the availability of historical data. Beginning in the first emissions reporting year (2011 or later) and for each year thereafter, use the procedures in paragraph (a)(2)(i) of this section to determine waste stream quantities. These procedures should also be used for any year prior to the first emissions reporting year for which the data are available. For other historical years, use paragraph (a)(2)(i) of this section, where waste disposal records are available, and use the procedures

outlined in paragraph (a)(2)(ii) of this section when waste disposal records are unavailable, to determine waste stream quantities. Historical disposal quantities deposited (i.e., prior to the first year in which monitoring begins) should only be determined once, as part of the first annual report, and the same values should be used for all subsequent annual reports, supplemented by the next year's data on new waste disposal.

\* \* \* \* \*

(ii) \* \* \*

(C) For any year in which historic production or processing data are not available such that historic waste quantities cannot be estimated using Equation TT-3 of this section, calculate an average annual bulk waste disposal quantity using either Equation TT-4a of this section when data are available consecutively for the most recent disposal years or Equation TT-4b of this section when data are available for sporadic (non-consecutive) years.

$$W_x = \frac{LFC}{(YrData - YrOpen + 1)} \quad (\text{Eq. TT-4a})$$

Where:

$W_x$  = Quantity of waste placed in the landfill in year X (metric tons, wet basis). This annual bulk waste disposal quantity applies for all years from "YrOpen" to "YrData" inclusive.

$LFC$  = Capacity of the landfill used (or the total quantity of waste-in-place) at the end of the "YrData" from design drawings or engineering estimates (metric tons). For closed landfills for



which waste quantity data are not available, use the landfill's design capacity.

YrData = The year prior to the year when waste disposal data are first available for all subsequent years from company records or from Equation TT-3 of this section. For landfills for which waste quantity data are not available, the year in which the landfill last received waste.

YrOpen = Year 1960 or the year in which the landfill first received waste from company records, whichever is more recent. If no data are available for estimating YrOpen for a closed landfill, use 1960 as the default "YrOpen" for the landfill.

$$W_x = \frac{WIP - \sum_{n=1}^{NYrData} W_{meas,n}}{(YrLast - YrOpen + 1 - NYrData)} \quad (\text{Eq. TT-4b})$$

Where:

$W_x$  = Quantity of waste placed in the landfill in year X (metric tons, wet basis). This annual bulk waste disposal quantity applies for all years for which waste quantity data are not available from company records or from Equation TT-3 of this section.

WIP = Quantity of waste in-place at the start of the reporting year from design drawings or engineering estimates (metric tons). For closed landfills for which waste in-place quantities are not available, use the landfill's design capacity.

$W_{meas,n}$  = Annual quantity of waste placed in the landfill for the  $n^{th}$  measurement year from company records or from Equation TT-3 of this section.

YrLast = The last year, prior to the reporting year, that the landfill received waste.

YrOpen = Year 1960 or the year in which the landfill first received waste from company records, whichever is more recent. If no data are available for estimating YrOpen for a closed landfill, use 1960 as the default "YrOpen" for the landfill.

NYrData = The number of years for which annual waste disposal quantities are available from company records or from Equation TT-3 of this section from YrOpen to YrLast inclusive.

\* \* \* \* \*

33. Section 98.464 is amended by:

- a. Revising paragraph (b) introductory text.
- b. Revising paragraph (b) (1).
- c. Revising paragraph (b) (3).
- d. Revising paragraph (b) (4).
- e. Redesignating paragraphs (c), (d), (e), and (f) as paragraphs (d), (e), (f), and (h), respectively.
- f. Adding a new paragraph (c).
- g. Adding paragraph (g).

§98.464 Monitoring and QA/QC requirements.

\* \* \* \* \*

(b) For each waste stream placed in the landfill during the reporting year for which you choose to determine volatile solids concentration for the purposes of §98.460(c)(2)(xii) or choose to determine a landfill-specific  $\text{DOC}_x$  for use in Equation TT-1 of this subpart, you must collect and test a representative sample of that waste stream using the methods specified in paragraphs (b)(1) through (b)(4) of this section.

(1) Develop and follow a sampling plan to collect a representative sample (in terms of composition and moisture

content) of each waste stream placed in the landfill for which testing is elected.

\* \* \* \* \*

(3) For the purposes of §98.460(c)(2)(xii), the volatile solids concentration (weight percent on a dry basis) is the percent volatile solids determined using Standard Method 2540G "Total, Fixed, and Volatile Solids in Solid and Semisolid Samples" (incorporated by reference; see §98.7).

(4) Determine DOC value of a waste stream by either using at least a 60-day anaerobic biodegradation test as specified in paragraph (b)(4)(i) of this section or by estimating the DOC value based on the total and volatile solids measurements as specified in paragraph (b)(4)(ii) of this section.

(i) Perform an anaerobic biodegradation test and determine the DOC value of a waste stream following the procedures and requirements in paragraphs (b)(4)(i)(A) through (E) of this section.

(A) You may use the procedures published by a consensus-based standards organization to conduct a minimum of a 60-day anaerobic biodegradation test. Consensus-based standards organizations include, but are not limited to, the following: ASTM International (100 Barr Harbor Drive, P.O. Box CB700, West Conshohocken, Pennsylvania 19428-B2959, (800) 262-1373, <http://www.astm.org>), the American National Standards Institute

(ANSI, 1819 L Street, NW., 6th floor, Washington, DC 20036, (202) 293-8020, <http://www.ansi.org>), the American Society of Mechanical Engineers (ASME, Three Park Avenue, New York, NY 10016-5990, (800) 843-2763, <http://www.asme.org>), and the North American Energy Standards Board (NAESB, 801 Travis Street, Suite 1675, Houston, TX 77002, (713) 356-0060, <http://www.api.org>).

(B) Use a minimum of four samples: two waste stream samples, a control sample using a known substrate (such as ethanol), and a digester sludge blank sample. Each waste stream sample must be appropriately ground to ensure the waste material is fully exposed to the anaerobic digester sludge.

(C) Determine the net mass of carbon degraded in the control sample as the difference in the results of the control sample and the digester sludge blank sample. Determine the net mass of carbon degraded in each waste stream sample as the difference in the results of each waste stream sample and the digester sludge blank sample.

(D) Determine the fraction of carbon degraded in the control sample as the net mass of carbon degraded in the control sample divided by the mass of carbon added via the substrate material in the control sample. If less than 50 percent of the theoretical mass of carbon in the control sample is degraded, the test run is invalid.

(E) Determine the DOC of each waste sample using Equation TT-7 of this section. If the DOC values for the two waste stream samples differ by more than 20 percent, the test run is invalid. The DOC of the waste stream is determined as the average DOC value of the two waste stream samples determined during a valid test.

$$DOC_x = \left( \frac{1}{DOC_F} \right) \left( \frac{MCD_{sample,x}}{M_{sample,x}} \right) \left/ \left( \frac{MCD_{control}}{MC_{control}} \right) \right. \quad (\text{Eq. TT-7})$$

Where:

$DOC_x$  = Degradable organic content of the waste stream in Year X (weight fraction, wet basis)

$DOC_F$  = Fraction of DOC dissimilated (fraction); use the default value of 0.5.

$MCD_{sample,x}$  = Mass of carbon degraded in the waste stream sample in Year X as determined in paragraph (b)(4)(i)(C) of this section [milligrams (mg)].

$M_{sample,x}$  = Mass of waste stream sample used in the anaerobic degradation test in Year X (mg, wet basis).

$MCD_{control}$  = Mass of carbon degraded in the control sample as determined in paragraph (b)(4)(i)(B) of this section (mg).

$MC_{control}$  = Mass of carbon added to the control sample via the substrate material in the anaerobic degradation (mg).

(ii) Calculate the waste stream-specific  $DOC_x$  value using Equation TT-8 of this section.

$$DOC_x = F_{DOC} \times \frac{\% \text{ Volatile Solids}_x}{100\%} \times \frac{\% \text{ Total Solids}_x}{100\%} \quad (\text{Eq. TT-8})$$

Where:

$DOC_x$  = Degradable organic content of waste stream in Year X (weight fraction, wet basis)  
 $F_{DOC}$  = Fraction of the volatile residue that is degradable organic carbon (weight fraction). Use a default value of 0.6.  
 $\% \text{ Volatile Solids}_x$  = Percent volatile solids determined using Standard Method 2540G Total, "Fixed, and Volatile Solids in Solid and Semisolid Samples" (incorporated by reference; see §98.7) for Year X [milligrams (mg) volatile solids per 100 mg dried solids].  
 $\% \text{ Total Solids}_x$  = Percent total solids determined using Standard Method 2540G "Total, Fixed, and Volatile Solids in Solid and Semisolid Samples" (incorporated by reference; see §98.7) for Year X (mg dried solids per 100 mg wet waste).

(c) For each waste stream for which you choose to determine volatile solids concentration for the purposes of paragraph §98.460(c)(2)(xii), and that was historically managed in the landfill but was not received during the first reporting year, you must determine volatile solids concentration of the waste stream as initially placed in the landfill using the methods specified in paragraph (c)(1) or (c)(2) of this section, as applicable.

(1) If you can identify a similar waste stream to the waste stream that was historically managed in the landfill, you must determine the volatile solids concentration of the similar waste stream using the procedures in paragraphs (b)(1) through (b)(3) of this section.

(2) If you cannot identify a similar waste stream to the waste stream that was historically managed in the landfill, you may determine the volatile solids concentration of the historically managed waste stream using process knowledge. You must document the basis for volatile solids concentration as determined through process knowledge.

\* \* \* \* \*

(g) For landfills electing to measure the fraction by volume of  $\text{CH}_4$  in landfill gas (F), follow the requirements in paragraphs (g)(1) and (g)(2) of this section.

(1) Use a gas composition monitor capable of measuring the concentration of  $\text{CH}_4$  on a dry basis that is properly operated, calibrated, and maintained according to the requirements specified at §98.344(b). You must either use a gas composition monitor that is also capable of measuring the  $\text{O}_2$  concentration correcting for excess (infiltration) air or you must operate, maintain, and calibrate a second monitor capable of measuring the  $\text{O}_2$  concentration on a dry basis according to the manufacturer's specifications.

(2) Use Equation TT-9 of this section to correct the measured  $\text{CH}_4$  concentration to 0% oxygen. If multiple  $\text{CH}_4$  concentration measurements are made during the reporting year, determine F separately for each measurement made during the

reporting year, and use the results to determine the arithmetic average value of F for use in Equation TT-1 of this part.

$$F = \left( \frac{C_{CH_4}}{100\%} \right) \times \left[ \frac{20.9_c}{(20.9 - \%O_2)} \right] \quad (\text{Eq. TT-9})$$

Where:

- F = Fraction by volume of CH<sub>4</sub> in landfill gas (fraction, dry basis, corrected to 0% oxygen).
- C<sub>CH<sub>4</sub></sub> = Measured CH<sub>4</sub> concentration in landfill gas (volume %, dry basis).
- 20.9<sub>c</sub> = Defined O<sub>2</sub> correction basis, (volume %, dry basis).
- 20.9 = O<sub>2</sub> concentration in air (volume %, dry basis).
- %O<sub>2</sub> = Measured O<sub>2</sub> concentration in landfill gas (volume %, dry basis).

\* \* \* \* \*

34. Section 98.466 is amended by:

- a. Revising paragraph (b) introductory text.
- b. Revising paragraph (b) (2).
- c. Adding paragraphs (b) (3) and (b) (4).
- d. Revising paragraph (c) (3) (ii).
- e. Revising paragraph (d).
- f. Revising paragraph (f).
- g. Revising paragraph (g) (1).

§98.466 Data reporting requirements.

\* \* \* \* \*

(b) Report the following waste characterization and modeling information:



\* \* \* \* \*

(2) A description of each waste stream (including the types of materials in each waste stream) for which Equation TT-1 of this subpart is used to calculate modeled CH<sub>4</sub> generation.

(3) The fraction of CH<sub>4</sub> in the landfill gas, F, (volume fraction, dry basis, corrected to 0% oxygen) for the reporting year and an indication as to whether this was the default value or a value determined through measurement data.

(4) The methane correction factor (MCF) value used in the calculations. If an MCF value other than the default of 1 is used, provide a description of the aeration system, including aeration blower capacity, the fraction of the landfill containing waste affected by the aeration, the total number of hours during the year the aeration blower was operated, and other factors used as a basis for the selected MCF value.

(c) \* \* \*

(3) \* \* \*

(ii) The year, the waste disposal quantity and production quantity for each year used in Equation TT-2 of this subpart to calculate the average waste disposal factor (WDF).

\* \* \* \* \*

(d) For each year of landfilling starting with the "Start Year" (S) and each year thereafter up to the current reporting year, report the following information:

(1) The calendar year for which the following data elements apply.

(2) The quantity of waste ( $W_x$ ) disposed of in the landfill (metric tons, wet weight) for the specified year for each waste stream identified in paragraph (b) of this section.

(3) The degradable organic carbon ( $DOC_x$ ) value (mass fraction) for the specified year and an indication as to whether this was the default value from Table TT-1 to this subpart, a measured value using a 60-day anaerobic biodegradation test as specified in §98.464(b)(4)(i), or a value based on total and volatile solids measurements as specified in §98.464(b)(4)(ii). If  $DOC_x$  was determined by a 60-day anaerobic biodegradation test, specify the test method used.

\* \* \* \* \*

(f) The modeled annual methane generation ( $G_{CH_4}$ ) for the reporting year (metric tons  $CH_4$ ) calculated using Equation TT-1 of this subpart.

(g) \* \* \*

(1) The annual methane emissions (i.e., the methane generation (MG), adjusted for oxidation, calculated using Equation TT-6 of this subpart), reported in metric tons  $CH_4$ .

\* \* \* \* \*

35. Section 98.467 is revised to read as follows:

§98.467 Records that must be retained.

In addition to the information required by §98.3(g), you must retain the calibration records for all monitoring equipment, including the method or manufacturer's specification used for calibration, and all measurement data used for the purposes of paragraph §98.460(c)(2)(xii) or used to determine landfill-specific DOC<sub>x</sub> values.

36. Section 98.468 is amended by adding, in alphabetical order, the definitions for "Construction and demolition (C&D) waste landfill" and "Design capacity" to read as follows:

§98.468 Definitions.

\* \* \* \* \*

Construction and demolition (C&D) waste landfill means a solid waste disposal facility subject to the requirements of subparts A or B of part 257 of this chapter that receives construction and demolition waste and does not receive hazardous waste (defined in §261.3 of this chapter) or industrial solid waste (defined in §258.2 of this chapter) or municipal solid waste (defined in §98.6 of this part) other than residential lead-based paint waste. A C&D waste landfill typically receives any one or more of the following types of solid wastes: roadwork material, excavated material, demolition waste, construction/renovation waste, and site clearance waste.

Design capacity means the maximum amount of solid waste a landfill can accept. For the purposes of this subpart, for landfills that have a permit, the design capacity can be determined in terms of volume or mass in the most recent permit issued by the state, local, or Tribal agency responsible for regulating the landfill, plus any in-place waste not accounted for in the most recent permit. If the owner or operator chooses to convert the design capacity from volume to mass to determine its design capacity, the calculation must include a site-specific density. If the design capacity is within 10 percent of the applicability threshold in §98.460(a) and there is a change in the production process that can reasonably be expected to change the site-specific waste density, the site-specific waste density must be redetermined and the design capacity must be recalculated based on the new waste density.

\* \* \* \* \*

37. Table TT-1 to subpart TT is amended by revising the entries for "Construction and Demolition" and "Inert Waste [i.e., wastes listed in §98.460(b)(3)]" and footnote a to read as follows:

**Table TT-1 to Subpart TT—Default DOC and Decay Rate Values for Industrial Waste Landfills**

Industry/Waste Type	DOC (weight fraction, wet basis)	k [dry climate <sup>a</sup> ] (yr <sup>-1</sup> )	k [moderate climate <sup>a</sup> ] (yr <sup>-1</sup> )	k [wet climate <sup>a</sup> ] (yr <sup>-1</sup> )
* * * * *				
Construction and Demolition	0.08	0.02	0.03	0.04

Inert Waste [i.e., wastes listed in §98.460(c)(2)]	0	0	0	0
* * * * *				

<sup>a</sup> The applicable climate classification is determined based on the annual rainfall plus the recirculated leachate application rate. Recirculated leachate application rate (in inches/year) is the total volume of leachate recirculated from company records or engineering estimates and applied to the landfill divided by the area of the portion of the landfill containing waste [with appropriate unit conversions].

- (1) Dry climate = precipitation plus recirculated leachate less than 20 inches/year
- (2) Moderate climate = precipitation plus recirculated leachate from 20 to 40 inches/year (inclusive)
- (3) Wet climate = precipitation plus recirculated leachate greater than 40 inches/year

Alternatively, landfills that use leachate recirculation can elect to use the k value for wet climate rather than calculating the recirculated leachate rate.

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